JULY 6, 1929 A McGraw-Hill Publication 20 Cents per Copy

AVIATION

The Oldest American Aeronautical Magazine

SPECIAL FEATURES

THE 48 HR. COAST TO COAST AIR-RAIL SERVICE OF *Transcontinental Air Transport*

WATERTIGHT *Subdivision* OF SEAPLANE HULLS AND FLOATS

FACTS ABOUT AIRCRAFT FACTORY *Personnel*

To the best of our knowledge no Bohn Ring True Bearing in an aircraft engine has ever failed — never!

RING TRUE BOHN BEARINGS

Aircraft Division

BOHN ALUMINUM & BRASS CORPORATION, DETROIT, MICHIGAN

New York • Chicago • Philadelphia • Cleveland • Pittsburgh

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FROM this

to this in 30 days

That was the record established in constructing this hangar for the Mid-Plane Sales and Transit Company at Minneapolis. What we have done for others, we can do for you.

Every sheet of the Robertson Protected Metal roofing and siding (*) for that hangar was cut to fit before it left the factory. And with the material went a plain, simple erection diagram which showed exactly where each piece was to go. Erection of the sheets was simplicity itself. No cutting and no fitting to do.

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This hangar, originally erected in France almost 12 years ago, is now serving in the Canal Zone

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(*) Robertson Protected Metal is an ideal material for hangars. Much less costly than "heavy construction," much longer-lived than unprotected metal roofing and siding—a happy medium between the two. The U. S. Government alone has used over 7,000,000 sq. feet of it in 7 years. Write for description of it.

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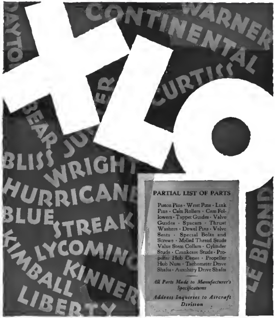

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"I certainly was tickled with the way the Moth flew yesterday, and I really think it is about the slickest little seaplane I ever have been in. With the gas tank about three-quarters full and myself in the rear cockpit (180 lbs.) she took off in 12 seconds. With an additional 170 lbs. in the front cockpit, she took off in 14 seconds. It obviously has lots of reserve performance. I know everybody is going to like the Moth very much as a seaplane."

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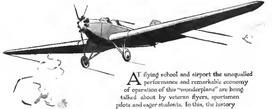

AT flying school and airport the unequalled performance and remarkable economy of operation of this "wonderplane" are being talked about by veteran flyers, sportsmen pilots and eager students. In this, the history of every modern industry is repeating itself in aviation circles. A gradual shakedown reveals the outstanding performers in every class. As a light plane for training, the AKL 25 demonstrates its superiority by unheard of economy. Its popularity with the pilot is based upon a successful record of eight years supremacy in Europe and America. Born as a glider it flies itself. Its twin in dependability is in its 40-50 horse-power Salmson radial air-cooled engine. As a result of its simple, rugged construction, an AKL 25 requires a minimum of attention. With wings demounted, and attached to the sides of the fuselage, it can easily be stored in a relatively small space. As standard equipment, the AKL 25 will add to the popularity, prestige and profits of any school of flying instruction. If your school is not making the money you think it should, write to us for comparative details. Increased production facilities enable us to make prompt delivery.

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EXHIBITOR — NATIONAL AERONAUTICAL EXPOSITION — CLEVELAND — August 24th to September 2nd, 1929

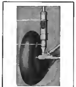
One of a series of advertisements featuring planes on which Aerol Struts are standard equipment.

AEROL STRUTS on every SPARTAN CHALLENGER

We welcome the Spartan Challenger to the ever-increasing group of prominent planes that have adopted Aerol Landing Struts as standard equipment.

Aerol Struts are entirely in keeping with the beauty, stability and efficiency of this latest contribution to the light commercial plane field.

In standardizing on Aerol Struts, the Spartan Aircraft Company offers purchasers of their planes the utmost comfort and safety in landing and quicker, snappier take-offs under almost any condition.



This view shows how Aerol Struts are installed between the fuselage and wheels. "A" is the stationary cylinder. "B" is the slidine piston attached to the axle allowing perfect freedom of movement yet effectively eliminating destructive shock before it reaches the fuselage.

Aerol struts are now standard on twenty-two makes of ships and optional on practically all others.

The performance of these struts has set a standard of safety and ship protection that is unequalled today.

Aerol struts are manufactured by The Cleveland Pneumatic Tool Company, Cleveland, Ohio.

"See Our Exhibit at National Air Races"

AEROL shock absorbing STRUT

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Brownback Motor Laboratories, Inc.

Equipped with the highest priced bearing in the world

YOU MAY BUY A BEARING AS A BARGAIN BUT TRY AND GET A BARGAIN OUT OF USING IT

for Nothing is apt to cost so much as a bearing that cost so little.

SKF Puts the Right Bearing in the Right Place

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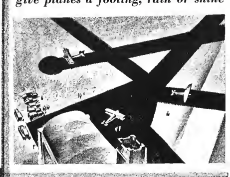
2307

SKF

Ball and Roller Bearings

Shock-Proof, Skid-Safe Runways
give planes a footing, rain or shine



THE day is not far distant when airport engineers will have to overcome the obstacles commonly presented *today* by poor runway conditions. It is becoming more and more an acknowledged fact that it's not alone the *length* of runways that determines their safety but also the surfacing materials used.

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FOR ROAD CONSTRUCTION REPAIR and MAINTENANCE

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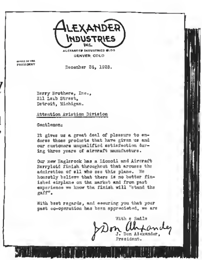

ALEXANDER INDUSTRIES INC.
ALEXANDER INDUSTRIES BLDG
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OFFICE OF THE PRESIDENT

December 24, 1928.

Berry Brothers, Inc.,
211 Leib Street,
Detroit, Michigan.

Attention Aviation Division

Gentlemen:

It gives us a great deal of pleasure to endorse those products that have given us and our customers unqualified satisfaction during three years of aircraft manufacture.

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With best regards, and assuring you that your past co-operation has been appreciated, we are

With a Smile
J Don Alexander
J. Don Alexander,
President.

EAGLEROCK WAS PRECEDED IN THIS SERIES BY STINSON, FOKKER, BUHL AND TRAVELAIR

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BERRY BROTHERS
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A notable combination of a great airplane and a great motor

The WACO "165" STRAIGHT-WING

HERE is every traditional feature of the dependable WACO airplane . . . plus the smoothness and power of the new J-6, 5-cylinder, Wright "Whirlwind" motor.

Here is a combination of snap and dash . . . a degree of beauty and comfort and safety . . . such as you've never found before in *any* airplane at *anywhere near* the price.

The WACO "165" Straight-Wing is made for those who want not simply ability . . . but dependability! For it *is* a WACO . . . true to the best traditions of WACO for *plus* value.

The WACO "165" takes off quickly, climbs rapidly, handles easily and does 125 and better, full out. And, like all WACOS, it asks no favors of a landing field. Fly it! You'll be impressed.

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THE WACO AIRCRAFT COMPANY*
TROY, OHIO

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"ASK ANY PILOT"

*Formerly The Advance Aircraft Company. The corporate name is changed to associate more closely the name of company and product. Ownership, operation and personnel remain as before.

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J-6 Wright "Whirlwind" Motor
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Wood propeller
Bendix brakes
Navigating equipment
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3-place . . . Dual controls
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(Add $275 for metal propeller)

CAVALIER

A light, two place monoplane with Pursuit Performance, offering new markets for airplane dealers.

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Certificate No. 138
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THE Cavalier, strongly financed, with ample manufacturing facilities is now in regular production. Here is a light monoplane that flys like a big ship—designed with an exceptionally high factor of safety for varying horse-power, exceedingly stable and comparable in every way with the finest airplanes of larger size. Cruising speed 90 to 100 miles per hour—fuel consumption but 4½ to 6½ gallons of gasoline an hour, depending on engine installation.

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NOW! Standardized EDO Floats for all planes up to 5100 pounds

Photograph shows smallest (14' 4") and largest (22' 5") New Series Edo Standardized Floats

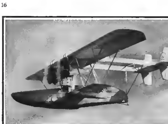
EDO Floats, interchangeable with wheel landing gear, are now completely standardized in a NEW SERIES consisting of eight distinct models, adaptable to all classes of land planes within the range shown by the accompanying table. Such standardization in floats of outstanding aerodynamic, planing and seaworthy characteristics, is a new and notable contribution to the development of sea-plane flying and has been made possible only through specialized knowledge gained in building successful floats for over thirty different types of land planes. For prices and further particulars of the New Series Edo Floats, address Edo Aircraft Corporation, 610 Second Street, College Point, Long Island, N. Y.

EDO
THE FLOAT MAKERS

NEW SERIES EDO FLOAT SPECIFICATIONS

MODEL Sub. Displ. in lbs. of ONE Float	1525	1835	2260	2665	3300	3830	4650	5300
	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.
For ships within this weight class, as land planes with gross load.	1100-1350	1350-1650	1650-2050	2050-2400	2400-3000	3000-3500	3500-4250	4250-5100
Maximum allowable gross weight as seaplanes	1600	1930	2380	2810	3470	4030	4750	5580
Total net weight added by float installation	160	190	225	250	300	350	410	450
Number of water-tight compartments per float	7	8	8	9	9	10	10	11
Over-all width of complete float installation	7' 10"	8' 0"	8' 11"	8' 11"	9' 8"	9' 8"	10' 6"	11' 0"
Maximum draft loaded	1' 0"	1' 0"	1' 2"	1' 2"	1' 4"	1' 4"	1' 7"	1' 7"
Length.	14' 4"	16' 4"	16' 4"	18' 4"	18' 4"	20' 4"	20' 5"	22' 5"

Prices F. O. B. College Point, complete with struts, wires, and attaching fittings, etc.



THE SIKORSKY
hooks up two great Continents

THE Pan-American Airways, pioneers in the air conquest of Central and South America, have selected Sikorsky amphibians as their reliance in covering the water routes along this great system.

Into the story of the reliability and safety of the Sikorsky is interwoven the story of Aluminum.

Strong Aluminum Alloys constitute more than half the material in their Pratt & Whitney engines. They are driven by forged Aluminum alloy propellers, non-corrosive, non-shatterable, everlasting.

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A broad technical knowledge of the application of these products to aircraft design and a complete equipment for their manufacture is at the service of the aircraft industry Inquiries are invited

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ALUMINUM AND ITS ALLOYS FOR AIRCRAFT

"CORSAIRS" ARE STANDARD
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Why? Simply because they have proven their merit time and again! The perfect balance, inherent stability and rugged construction of Vought quality planes have earned these remarkable ships an enviable reputation.

Fast, brilliant performance with astonishing smoothness and ease is the story they tell on either land or water. "Corsairs" are easily convertible to landplanes, seaplanes or amphibions —each an unsurpassed all around performer.

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Metal Aircraft Corporation Municipal Airport Cincinnati, Ohio Truscon Hangar, 150 ft x 300 ft with 70 ft center span

Truscon Channel Type Steel Door 68 ft x 16 ft Truscon Steel Windows. Ferrodeck Roof. Structural Steel and 16' x 16' Jacknife Door in rear.

HANGARS

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Truscon furnishes you either the complete building from standardized units or the Steel Doors, Steel Windows and Steeldeck Roofs adapted to your own design. Write us your requirements so we can offer suggestions without obligation to you.

TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
AERONAUTICAL DIVISION

Trussed Concrete Steel Company of Canada Limited, Walkerville Ont. Warehouses and Offices in Principal Cities of the United States and the Dominion of Canada

TRUSCON HANGARS
AND HANGAR DOORS

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announces
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The MAILMAN

"Planes Built to a Standard—Not to a Price"

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AVIATION

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AVIATION
THE OLDEST AMERICAN AERONAUTICAL MAGAZINE
A McGraw-Hill Publication | Established 1916
EDWARD P. WARNER, *Editor*
Volume ... **July 6, 1929** ... Number 1

Airplane and Railroad Work in Double Harness

THE INAUGURATION of combined air-rail passenger services is a sign of the times For a dozen years, or since the strain of war came upon the nation, co-ordination has been a watchword of ever-growing force. We have come to realize that our economic structure cannot be regarded as a huge and irregular pile of separate pieces, rubbing each other and interfering with each other Its parts must be fitted together more delicately than any picture puzzle, providing mutual reinforcement and making a harmonious design

Nowhere is such co-ordination of industry and commerce more important than in transportation Travel and shipment of goods by air and water and highway and rail must be planned as a whole and not as so many isolated activities, if the convenience of the user is best to be served and if he is to be given the utmost in efficiency and economy No single form of transport could satisfactorily exist by itself There is no traveler who confines himself to the patronage of a single type of vehicle. For the operators of the several transport services to consider themselves as inevitable competitors for a definite amount of business, engaged in a war of mutual extermination, would be calamitous for their own balance-sheets and the happiness of their clients

Such things have happened in the past, but fortunately there seems to be no danger of their repetition. The lesson has been learned The best proof of that is furnished by the recent rapid flowering of co-operation between the airline and the railroad, exemplified in the opening of Transcontinental Air Transport as a complete joint coast-to-coast system, having its own fields and its own ground services and under a single management in which the railroads share

JOINT OPERATION has been the subject of theoretical discussions for several years Schedules have been studied, and possible important savings in time, by using the airplane over some particular section of a rail journey, have been pointed out That the project now passes from theory to practice is the result of the gradual, but finally complete, development of a conviction that all concerned will stand to gain by whole-heartedly working together

The railroads will gain They have suffered in public esteem at times in the past by allowing the growth of an impression that their attitude toward any innovation in transport was one of pig-headed and irreconcilable opposition They will enjoy commensurate benefit, and a waxing of public confidence, from the demonstration that they are prepared to welcome the airplane as a partner of the iron horse There will too, be a direct accession to limited train receipts from passengers who could not spare the time to make the trip at all if the whole distance had to be covered by rail but who will be able to go now that they can use the airplane to speed up their journey There will be the favorable publicity which always comes from satisfied customers who have received a special service

THE AIRCRAFT INDUSTRY and the air line operators will gain They too will tap a traffic that would otherwise be beyond reach There are many travelers who are quite ready to interpolate aerial sections in their journey without being able to accept the idea of flying all day and all night There are others who may make a three-thousand-mile flight on an air mail route once as an adventure, or be prepared to do it in emergency, but cannot yet reconcile themselves to it as a normal and frequent incident of business travel. Those groups hold out the promise of a tidy revenue to the air-rail operation on routes too long to be flown in a single day, or including sections exceptionally dangerous or difficult for the maintenance of a regular and reliable passenger service

Even more important from the point of view of aeronautical interests is the assurance of sympathetic railroad co-operation Guided not only by their own inclinations but by restrictions imposed by the Interstate Commerce Commission, the range of activity of the railroads is narrowly limited Many a traveler by air, like ourselves, has had reason to regret the impossibility of checking heavy baggage by rail when making a flight upon which it could not be carried Many an operator of air lines

must have looked with longing eyes upon consolidated ticket offices in hotels and business centers and wished that he might have the benefits of so thoroughly organized a transportation-selling service. The aerial sections of the air-rail routes are now to have those advantages, and we venture the hope that this will prove the thin end of the wedge, and that the merits of general co-operation will become so apparent that the railroads and airlines will plan to supplement each other's services as a matter of course, even where there is no community of financial interest.

The traveling public will gain. Their choice of routes will have an added flexibility, with the option of going by air, going by rail, or using a combination of the two with much more speed than the railroad and much more comfort than is at present possible in a straight-through flight of transcontinental extent. Those conveniences, resulting from a draft upon the railroads' services, for which the air line operator would have cause to be thankful, will also appeal to the patrons of the line.

There may be enthusiasts who will believe the co-operative service a step backward, an unnecessary admission that the airplane is incapable of meeting all transportation demands unaided. We strongly dissent from their view. Whatever may be true in the future, as the technical capacities of heavier-than-air craft improve, the air-rail line has a definite place on the transportation map now. It is only to be hoped that we shall not have to make complaint against an undue slowness in its development. So far only a handful of railroads are participating, and only a single service has been organized as a complete and independent unit. There should be many more.

//

The Big Merger

THE ANNOUNCEMENT of the formation of the Curtiss-Wright Corporation, coming six months after the merging of several important groups of interests into the United Aircraft and Air Transport Company, and taken with the other striking developments in aircraft finance in the intervening period, turns attention again upon the economic advantages and drawbacks of such vast combinations, as well as upon the legal and other factors affecting them. It may be taken for granted that every financial rearrangement or grouping is in the interest of the companies directly involved, else it would not be effected. The position of the ultimate consumer of the product, however, is not so automatically obvious. It deserves analysis from the consumer's point of view.

As the buyer of airplanes for commercial purposes or private use sees it, there are two great advantages from the assembly of manufacturing companies into units of magnified strength and scope. He can fairly hope for lower prices. He can entertain the absolute assurance of better service. The larger the parent company the more elaborate can be the ramifications of its service organization. The airplane industry has not as yet reached the status of automobile manufacture. It is still small enough so that the maintenance of a nation-wide network of properly-manned and fully-equipped stations for distributing and giving maintenance service on a single product is a very serious burden. It is lightened by being shared, and the purchaser gains the assurance of really first-class service, which only a very limited number of manufacturers of aeronautical equipment are prepared to give on a national scale at present. Score one in favor of the merger plan.

LOWER MANUFACTURING COSTS and the possibility of lowered prices may come from improved management, the accumulated experience and the best talents of the whole organization being made available to each of its parts. They are sure to come from augmented research activity. Mr. Keys and Mr. Hoyt agree, and state our own view with perfect accuracy, in seeing improved provision for research as the most important outcome of such mergers as that of last week. It is safe to say that there never has been a well-planned and well-executed program of industrial research which did not, in the long run, pay for itself ten times over, but small manufacturers may be excused for feeling loath to embark upon expensive experimental activities most of the results of which, once embodied in their product, would be available to their competitors almost as soon as to themselves. Amalgamation increases their financial strength to the point where elaborate programs of study of scientific fundamentals become feasible. To the improvement of product, the lowering of production cost, and the prolific flow of novel invention which come from such programs, the experience of General Electric, General Motors, du Pont and dozens of other great industries bear witness. So the merger gains another point.

The consumer's frequent dubious attitude toward combination proceeds from fear that competition may be suppressed, and monopoly breed arrogance. Our history is full of the record of legislative attempts to quench that danger, and there have been occasional demonstrations that in particular instances the fear was justified.

THERE IS NOT the slightest likelihood that the aircraft industry will add itself to the roll of such cases. The airplane is a product inherently non-susceptible of monopoly control. The recent mergers, creating several competing groups of very great strength, leave in the field more fully independent producers of aircraft than there are independent builders of automobiles today. Furthermore, and this is a curious anomaly, mergers have operated almost without exception to bring together companies already producing non-competitive lines. In the most highly competitive class, the open-cockpit three-seater of from 100 to 200 horsepower, the mergers have had no effect whatever, and the independents continue to be numbered by dozens. Nearly the same can be said of the single-engined closed-cabin monoplanes. No peril of monopoly impends.

It is not to be supposed that the process of merger has reached its end. It needs no ear to the ground in Wall Street to forecast that there will be more of them. The logic of the situation assures us of that. As the process goes on, manufacturers in the parts of the field most directly agected will need to be watchful of their own interests, but the aeronautical public as a whole can await the event with complacency.

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Hawks Sets a Record

THE REMARKABLE performance of Frank M. Hawks in making a double crossing of the continent in a total flying time of only 36 hr. 49 min. and with a bare seven hours of rest intervening between the two non-stop journeys, at an over-all air-line average of nearly 140 m.p.h., cannot be allowed to pass without editorial comment. New records are innumerable, but this one has a special technical significance.

To pay tribute to the sensational performance of the airplane, to the flawlessly consistent functioning of the engine, and to the remarkable stamina displayed by the pilot is merely to expand upon the obvious. It is not by absolute standards, but in contrasts, that the weight of the Hawks flight best becomes apparent.

It presents a happy contrast, for example, to the average record of trans-oceanic adventure over the last two years. A successful flight over land involves all the problems, except the navigational ones, of a trip of equal length over open water. The difference appears when some error in calculation, or some evil and unpredictable chance, turns success aside. If Hawks' engine had gone wrong, as the best of engines have been known to do, or if he had run into impossible weather, as will occasionally happen, he would have flown back to try again the following week. In a trans-oceanic flight, under the same circumstances, the best that can be hoped for is that thorough and immediate search may avert loss of life, as has so happily been the case with the Spanish expedition just rescued by a British aircraft carrier. The far more probable outcome, especially when a landplane is ventured instead of the flying boat which the Spaniards were wise enough to employ, is suggested by the fate of the score of gallant men who have disappeared into the void that lies between Newfoundland and County Galway. There will always be pilots eager to make the utmost test of their machines, and to excel anything that has been done before. That is as it should be, and we should be proud that it is so, but we join to our admiration of their courage and pioneering spirits a hope that more of them will follow the trail blazed by Goebel, Collyer, and Hawks rather than that of Lindbergh, Chamberlin, and Byrd. That the Atlantic can be flown has been proven repeatedly. The multiplication of further attempts to repeat the feat, especially with land planes brings no gain commensurate with the hazard of invaluable lives, and even putting that consideration aside, failures, even though there be no loss of life, are the worst possible publicity for aviation as a mode of transport.

Hawks' flight must suggest some thoughts to the designers of military airplanes. An airplane designed primarily for passenger transport, normally carrying a passenger load well in excess of the military load of single-seater pursuit types, has set up a cross-country mark that most pursuit planes would find hard to excel. It would of course be absurd to see in that any evidence of inferiority of military design, but it is clear that those who work on the pursuit craft have recently given relatively more attention to ruggedness of structure, ease of maintenance, vision, and other matters of that sort, and have laid relatively less weight upon performance than have the builders of the fastest commercial planes. Perhaps the pendulum has swung too far. We are inclined to think that it has, and that designers should be turned loose to take full advantage of the N.A.C.A. cowling and other innovations and permitted to use supercompressed engines and special fuels to make the two-hundred-mile pursuit airplane a fact. It has long been a dream, but the necessity of periodic increase of load factors, the frequent addition of new items of equipment to the useful load, and the intermittent enactment of specifications favoring serviceability at the expense of performance have made the actual rate of progress in pursuit plane speeds disappointingly slow. Hawks comes to remind us that the gap between racing speeds and those of service planes has become surprisingly large.

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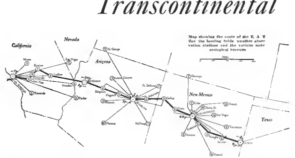
Mufflers Again

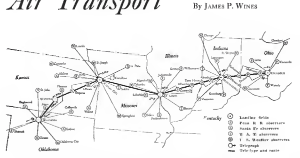
IT IS HARD for aeronautical enthusiasts to put themselves in the places of the general public who do not regard flying as a "cause." In spite of newspaper publicity and the effervescence of a few, the man in the street does not feel a vital excited interest about everything that pertains to flying. His interest in not more than casually aroused until flying begins to have an effect on his daily life. If flying is brought to his attention in an unpleasant way he will be apt to harbor a grudge and to be negative rather than neutral in his reactions.

Unfortunately this negative attitude is being developed in numerous places. Many planes are still being flown with open exhausts and every time they go up they advertise the fact that airplanes have an unpleasant side. Absolute quiet can not as yet be obtained in a plane but the sharp staccato bark of the open exhaust can and should be eliminated.

THE 48 HR. COAST TO COAST AIR-RAIL SERVICE OF *Transcontinental Air Transport*

By JAMES P. WINES





WITH perhaps the most extensive preparations that have preceded the opening of any air-line completed, Transcontinental Air Transport, Inc, in conjunction with The Pennsylvania Railroad Company and The Atchison, Topeka and Sante Fe Railway Company, will inaugurate its 48-hr combined rail and air passenger service from coast to coast, Sunday, July 7

Since the organization of Transcontinental Air Transport as a Delaware corporation in May, 1928 preparations for the inauguration of the air-rail service have been underway Landing fields have been constructed and lighted passenger terminals and hangars have been erected, an extremely efficient weather reporting system has been developed, radio and tele-type equipment has been installed, and last, but not least the operating personnel has been recruited and trained

In all, it involved a tremendous amount of labor, and it is small wonder that the work required over a year to complete Of course, it would have been possible to have started operations without such complete preparations That is to say, it would have been possible to disregard some of the minor things, which perhaps have no bearing on safety and were adopted simply to provide a little more comfort for the passenger, but the word had gone out from headquarters that T A T would not institute its service until everything was in absolute readiness From time to time in the past year it was rumored that Transcontinental Air Transport was about to start operations Still there was no official word forthcoming from those in charge The stock answer given to all queries on the subject was that service on the line would be inaugurated "the day we are properly ready." These are the words of C M Keys president of the airline operating company and they are the words adopted by other officials of the line

EVEN as late as May, this year, when the passenger terminals and hangars were nearing completion, no one knew the exact date of the opening of the service Then came the announcement that the first passengers to make the transcontinental journey over the T A T line will leave the Pennsylvania station in New York on "The Airway Limited" at 6 05 p m, July 7 arriving in Columbus O the next day at 7 55 a m where they will embark in planes of Transcontinental Air Transport for the flight to Waynoka, Okla. That evening they will board a train of the Sante Fe line for Clovis N M, where they enter other T A T planes for the flight to Los Angeles They will arrive there at 6 42 p m July 9

It was also announced that eastbound service would be inaugurated July 8 In going east the passengers leave Los Angeles at 8 45 a m making the first leg of the journey by air Arriving in Clovis in the evening they board the eastbound 'Scout' of the Santa Fe railroad for Waynoka and following their arrival there the next morning they fly to Columbus arriving there at 7 26 p m one-half hour before the departure of the train that brings them into New York the third morning at 9 50 a m

By traveling the T.A T line transcontinental passengers will be able to save fully 36 hr over the time that it takes to span the continent by rail For example, the first passengers will leave New York at 6 05 p m Sunday, and will arrive in Los Angeles at 6 42 p m Tuesday By rail, the best service to the West Coast is through Chicago Let us assume that a man leaves New York at 8 30 p m, Sunday, on train No 19 of The Pennsylvania Railroad, which is known as the "Chicago Day Express" This train is selected because it makes the best connections with "The California Limited," one of the fastest Santa Fe trains to the West

The traveler will arrive in Chicago at 7 40 p m Monday and will have time enough with very little to spare to go from the Union Station, the terminal for the trains of the Pennsylvania system, to the Dearborn Street Station from which the Santa Fe train leaves at 8 15 p m Aboard that train he is faced with a journey that will last two days and three nights He has already been on the way 24 hr and is just leaving Chicago, while the T A T passengers are aboard a Pullman car outside Waynoka. At 9 45 p m the next day Tuesday, he arrives at La Junta Colo At that time those traveling the T.A T route have been in Los Angeles for over three hours by clock time The rail passenger does not arrive there until Thursday at 9 15 a m

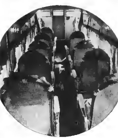
Not only will the Transcontinental Air Transport system save a great deal of time in traveling across the continent but it will effect a saving for those traveling to other points in the United States, since connections with rail systems operating to and through the stops on the T A T system may be made For instance, a person who wishes to go from New York to New Orleans may make use of the service as far as St Louis, where he can change to one of the fast trains operated by the Illinois Central to the South

The stops along the air route are at Columbus; Indianapolis, Ind, St Louis and Kansas City, Mo Wichita, Kan Waynoka, Clovis, Albuquerque, N M, Winslow and Kingman, Ariz, and Los Angeles The usual stops on the Pennsylvania and Santa Fe lines, of course are made by the trains that will carry the T.A T passengers It might be added that in evolving the schedule for the air-rail line arrangements for as many rail connections as possible were made

THE OPERATION of an airline has often been likened to that of a railroad, and in Transcontinental Air Transport we have a system the success of which will depend largely upon the ability of the operators to maintain a railroad-like schedule The T A T planes must make connections "on time" It probably would be possible for the trains to make up some lost time during the night but it is up to the airline officials to see to it that the planes operate on schedule so that this is not necessary

As a matter of fact, there will probably be little difficulty in this regard Although the service has not had the entire fleet of 10 Pratt & Whitney "Wasp" powered Ford transport monoplanes for any length of time, officials of the company have had the use of some of the Ford

planes for a number of months They know exactly what may be expected of these transports, and the schedules have been worked out on the basis of the performance obtained In fact, it is more than likely that the T.A.T planes will arrive ahead of time rather than behind To further perfect the operation of the air division of the system, however, and to familiarize the pilots with the terrain over which they must fly, the T A T planes



The cabin of one of the T. A. T. Ford planes

have been making dummy runs over the routes since June 24 Of equal if not more importance than this, though, are the preparations for the opening of the service, which have been going on for the last year

The transcontinental air-rail service which is being inaugurated July 7 was conceived before the flight of Col Charles A. Lindbergh from New York to Paris by a certain official of National Air Transport, Inc, operator of the New York-Chicago air mail line In the rough, the idea was simply that, with aviation in its present stage of development, a transcontinental air passenger line should be operated in conjunction with existing rail lines, so that the passengers might ride in Pullman cars at night and fly during the hours of daylight The idea also contained the thought that flying over the Alleghenies was to be avoided and that the route should be farther south than Chicago and the Great Lakes region These views doubtless came as a result of experience with fog over the mountains and with the winter weather in the region of the Lakes

At any rate, Transcontinental Air Transport, Inc., was the result The company was formed shortly after Colonel Lindbergh's famous flight by a number of individuals prominently identified with the aircraft industry Some of them were associated with Curtiss Aeroplane & Motor Company, Inc, others with National Air Transport, and still others with Wright Aeronautical Corporation There were also representatives of several banking firms including Blair & Company, New York, Knight, Dysart & Gamble, St Louis, and The State National Bank of St Louis The Pennsylvania Railroad Company, likewise, was interested

Within a comparatively short time after the formation of the company, a technical committee was appointed by the board of directors for the purpose of handling all technical problems that might arise Colonel Lindbergh was secured as the chairman of this committee, and with him were William B Mayo, chief engineer for Ford Motor Company, Charles S. "Casey" Jones, now president of Curtiss Flying Service, Inc, and Maj. Thomas G Lamphier, until recently commander of the First Pursuit Squadron of the Army Air Corps.

The next step was that of ascertaining the route Numerous surveys were conducted, both by air and on the ground, weather reports and railway schedules were studied, and finally, a route—approximately the same as it is today—was selected Along this route, however, there were no existing airports, the surveys showed, which met with the requirements set by the technical committee In addition, Transcontinental Air Transport wanted its fields located as near to the railroad lines as possible to facilitate the transfer of the passengers from the planes to trains, and vice versa. In fact, it wanted its airports immediately adjacent to the railroads wherever such an arrangement could be made

The airport problem was partially solved when four cities along the route agreed either to provide new airports or to improve those then in existence These cities were Columbus, St Louis, Kansas City and Wichita. Indianapolis might also be included in this group, since the field used by T A T. planes there was constructed by the State of Indiana West of Wichita, with the exception of Albuquerque, Los Angeles and San Francisco, the air transport company constructed its own airports At Albuquerque and Los Angeles, Transcontinental Air transport leased land for the construction of its buildings and arranged for the use of the fields The port at Albuquerque is privately owned, while the one at Los Angeles is the Grand Central Air Terminal, Glendale. So far, no field has been selected at San Francisco

It might be explained that San Francisco and Los Angeles are dual western terminals of the air-rail line Westbound passengers may leave Los Angeles on the Southern Pacific after the arrival of the T A T planes in the afternoon, arriving in San Francisco the next morning, or they may wait overnight and fly up in one of the planes operated by Maddux Air Lines, Inc. It will be remembered that this west coast line was recently acquired by T.A.T Eastbound passengers, likewise may leave San Francisco by rail the night before, or they may fly from San Francisco early in the morning, making connections with the T A T planes at the Grand Central Air Terminal

The airports at Columbus, Waynoka, Clovis, Winslow, and Kingman are located along the railroad rights of way Since three of these fields are located outside of the cities and are junctions of the rail and air lines they have been given other names At Columbus, for example, the field is eight miles east of the city The Pennsylvania Railroad has erected a passenger station there, and it is now a station stop, known as "Port Columbus" At Waynoka, the field is four and one-half miles east of the city, and has been designated, "Airport, Okla." The airport at Clovis, five miles west of the city proper, is "Portair"

Stout Field is the port used by Transcontinental Air Transport planes at Indianapolis, although a municipal field is being considered and when constructed may become the site of T A T operations. The use of Lambert-St Louis Field at St Louis also is only temporary, according to officials of the airline company T A T

will move to the new Steinberg Field on the Illinois side of the Mississippi River next spring The Kansas City Municipal Airport and the Wichita Municipal Airport are the two bases of operations for T.A T in those cities The Kansas City field is about five minutes from the center of the city, while the Wichita airport is a little over five miles from the business section The Glendale field, of course, is but 15 min by automobile from the Los Angeles City Hall At each airport, T.A.T. is placing the newly developed "Aero Car" buses in service to transport passengers to and from the fields These are in reality trailers, towed by automobiles

To keep a visual record of the work as it was completed, the officials of the air transport company had a progress chart drawn on which were listed the 11 fields utilized by the service. Spaces were provided for each unit of the work necessary, and, as each job was finished, its space was filled in This chart is interesting, since it shows the tremendous amount of labor involved in preparing the fields for the opening of the service

The first spaces on the chart are devoted to the selection of the sites, preliminary surveys, purchase or lease of the sites, accurate surveys, meteorological surveys; preliminary arrangements for power, water and telephone, the placing of runways, buildings, radio stations, boundary, beacon, flood, obstacle and ceiling lights, the completion of plans for the stations, hangars, fueling systems, ground systems, and towers, the taking of legal steps to close roads, and the obtaining of permission for obstacle lights and the construction of railroad sidings The next steps shown are those of letting contracts for the construction work, including the work of clearing and grading the sites, fencing, and well drilling

These tasks, on the chart, are followed by spaces for the purchase of radio sets for the planes and ground stations, direction finders and accessories, the lights and meteorological instruments After

An air view of Port Columbus, showing the railway station the T A T hangar and the municipal passenger station

Towing one of the T A T all metal Ford-Stout monoplanes into its hangars at the western terminal of the line

that, the starting and the completion of the construction and installation work are listed Included in this is the installation of a tele-type system, linking all the T A T stations from Columbus to the West Coast The last job listed is that of lighting of the airway. This was necessary, because Transcontinental Air Transport expects later to inaugurate a night service on the western division The airport lighting was necessary, also since the flights will end after dark in some cases during the winter months

Probably the most important of all the work that has preceded the opening of the T A T service is the development of its weather reporting system A complete meterological bureau, in charge of a competent meteorologist, has been established at each landing field along the route In addition, there are 72 observation stations covering the territory on both sides of the route The location of these stations is shown on the accompanying map The 10 major stations will receive the Government weather reports twice daily These reports, combined with the observations made at each station and the reports from the 72 observers, will form the basis for information to be furnished the pilots of T A T planes This information will include the weather conditions prevailing at the destination, the conditions that may be encountered along the route, changes that may be expected, and the altitude at which the most favorable flying conditions are to be found

The tele-type and the two-way radio communication systems will be of the utmost importance in the proper functioning of this weather reporting service The observers, by the way, are for the most part employees of the Pennsylvania and Santa Fe railroads, who have been trained by the T.A.T. meteorologists in making observations In some cases, the stations of the U S Weather Bureau are co-operating with the airline in submitting rrports In others, where neither The Pennsylvania Railroad, the Santa Fe or the Weather Bureau had men located advantageously, T.A.T. is employing its own weather observers The tele-type and radio systems will also be used in dispatching planes, transmitting company messages, and for making reservations Passengers are expected to use the service only in case of emergency

Taking the weather reporting system as an example, it will be seen that the T A T coast-to-coast service is extremely well-founded Everything to provide for safety and regularity of operation has been provided The 48-hr service is one that may be expected to function day in and day out, and in opening its line, Transcontinental Air Transport may be said to be adding an invaluable link to the transportation facilities of the country

Heating AND *Ventilating* FOR *AIRPORT BUILDINGS*

By E. C. Blackburn, Jr., M.E.

Article I: *Method of Computing the Heating Load Requirements of a Typical Installation*

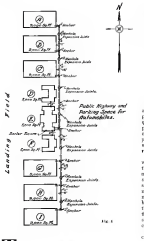


Fig. 1

THE DEVELOPMENT of airports throughout the United States has now reached the stage where it would be advisable for airport owners to pause a moment and give some serious thought to their buildings and the mechanical equipment that should be installed in them

In these articles we will consider only the problems of heating and ventilating The buildings themselves constitute a problem for the architect Therefore, in our discussion here we will assume buildings that conform somewhat to the usual types found on the average airport

Unfortunately, there are many architects who feel that the architectural work is all-important and that the mechanical equipment is just a sort of necessary evil which they must tolerate

I have heard some architects, in discussing a project of this kind say "When the buildings are about half completed we will call in a heating contractor and have him scatter some radiators around If it heats, all right, and if it doesn't all right' Needless to say, this procedure is not desirable from the standpoint of the owner and will not be conducive of the best results

I have seen this method used on various buildings a great many times and it is invariably unsuccessful In the first place it deprives the owner of the saving in actual cash that he may derive from calling for competitive bids on the work In the second place, it is quite likely that it will be found necessary to make expensive alterations in the portions of the building already constructed before the heating plant may be installed properly Last, but not least, the owner does not know what class of material or what type of system he is to receive

On the other hand assuming that this portion of the work has been carefully engineered, the owner will find that he has a set of plans showing clearly all the equipment that is to be installed, where it is to be installed, sizes of mains and other details He also has a set of specifications on the work stating in detail just how the installation is to be made, and the type of equipment that must be installed In this case he calls for competitive bids from reliable contractors and it is safe to predict that the price will be lower This is due principally to the fact that the contractor is not faced with the necessity of adding various arbitrary amounts to his bid to cover unforseen contingencies

When the work is handled in this manner the engineer can, as the work on the plans progresses confer with the architects on desirable changes in construction to facilitate the installation of the heating equipment Thus these changes in construction may be made on the drawings, and it is much cheaper to make changes on drawings than on the actual building If the design of the buildings and the mechanical equipment to be installed therein is all carefully done, no changes of a serious nature will be found necessary in the actual construction of these buildings This, of course, does not mean that if the owner changes his mind about the way he wants a certain portion of the work arranged after actual construction has begun, that additional expense will not be involved

OWNERS of large garages and repair shops became firmly convinced long ago that it was to their interests financially, to heat and ventilate their buildings adequately It has been definitely proved that their mechanics turn out more and better work when they are working under conditions of physical comfort Even more important, although it is not so apparent, is the ventilating system that protects employees from the evil of exhaust gases or spray and dope room fumes

The question of heating the hangars is one that is of the utmost importance and should be given careful thought In an unheated building of this type, there is usually a small office of some sort partitioned off in a corner In this office you will quite likely find an old-fashioned oil heater You cannot blame the mechanics for dropping in here occasionally for relief Here again you have a decrease in efficiency

But that is not the most serious part of it Hangars are not always constructed of fire-proof materials at the present time, and even if they were they have stored in them thousands of dollars worth of highly inflammable airplanes In most cases airports are located quite a distance from the city fire fighting apparatus Thus, for the lack of an investment of a few thousand dollars in adequate heating equipment many thousands of dollars in airplanes may be sacrificed

In these articles we will assume a layout of buildings for an airport We will then take a hangar building and design a complete heating system for it first determining the amount of heat required locating the heating surfaces and running supply and return piping to each heater

The other airport buildings are of too varied a nature to make it practical to go into detail on these, as each one is a separate problem and must be treated individually

However we will assume certain heating loads for these buildings and then go on to the design of the boiler plant itself and the method of conveying the heating medium to the various buildings We will discuss the most desirable fuels and other features of the boiler plant

Ventilation will also be discussed briefly and a few words said on the desirability of providing mechanical ventilation for certain portions of the various buildings

And finally, we will discuss briefly the several different methods of charging for heat where many of the different buildings are leased to firms not affiliated with the owners of the airport.

The arrangement of buildings on the airport under consideration, we will assume to be as shown in **Fig. 1** Buildings *A*, *B*, *C*, *G*, *H*, and *I*, are hangars and are all of the same size and construction

Building *D* we will assume, houses the meterological station, radio station fire fighting apparatus flying school, class rooms and offices laboratories, etc

In building *E* we will assume, are housed the general offices of the airport, air transport company offices, passenger terminal ticket offices, rest rooms, ambulance depot, first aid station, and boiler room

Building *F*, is an up-to-date hotel equipped with restaurant ball room, laundry, etc, in addition to its housing facilities

The amount of heat required to warm a building, or any portion of a building such as a separate room, depends on the volume of the space to be heated, the area and type of construction of the exposed walls, and the area of exposed windows The area and type of construction of the roof over the space to be heated must be considered also "Exposed walls" and "exposed windows" refers to those walls and windows that are actually exposed to the outside weather conditions Every room and every building has a certain definite heat loss Obviously this will depend

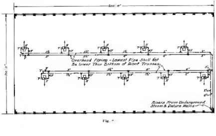


Fig. 2

on the construction of the building and also on the difference between the outside temperature and the temperature of the room. If the temperature in the room is the same as that existing outside, a state of equilibrium exists and there is no transmission of heat through the walls, windows, etc.

A GREAT MANY TESTS on the rate of heat transmission through various types of building construction have been made by engineering societies and corporations in this field. The results of these tests are available in many of the up-to-date handbooks dealing with this subject. There are so many types of construction and so many different ways of treating the subject that it would not be practical to attempt to reproduce them here.

These tables give the rate of heat transmission through the type of construction in question in B.t.u. per sq. ft. per hr. per degree difference between the inside and outside temperatures.

The B.t.u. (abbreviation for British thermal unit) is the unit of measure for all heating calculations. It is defined as "the amount of heat required to raise the temperature of one pound of water from 62 deg. F. to 63 deg. F."

Some tables give the rate of transmission for each type of construction based on a temperature difference of 70 deg. F. between the outside and inside, then give a table of factors to be used in determining the rate of transmission for any temperature difference other than 70 deg. F. These are the tables that we will use in all our calculations.

In determining the amount of heat required to warm the room then, it is first necessary to calculate the total heat transmission from each square foot of exposed wall and roof, each square foot of exposed window, and the amount of heat required to raise the temperature of the air in the room. The total of these amounts represents in B.t.u. the amount of heat that must be supplied to maintain the desired temperature.

The best way to make this clear is to figure a complete problem. So we will take one of our hangars and determine the amount of heat required to maintain the desired conditions in it. Fig. 2 we will assume is a plan of hangar *A* Fig. 1. In Fig. 3 is shown a cross section through this hangar.

First we must compute our quantities. The volume of air contained in the hangar will be the product of the length, width and average height. Referring to Fig. 2 we will see that the length is 200 ft. and the width is 100 ft. In Fig. 3 the average height is indicated as 25 ft. Therefore the volume will be 200 ft. × 100 ft. × 25 ft. = 500,000 cu. ft.

We will assume that the prevailing winds are from the North during the heating season. It will be advisable then to add 15 per cent to the area of the North wall and 10 per cent to the area of the West and East walls.

From the dimensions shown in Fig. 2, and Fig. 3, the area of the North wall is 200 ft. × 20 ft. × 1.15 = 4,600 sq. ft. The area of the West wall is 100 ft. × 25 ft. × 1.10 = 2,750 sq. ft. The area of the East wall, of course, is the same as that of the West wall. The area of the South wall is 200 ft. × 20 ft. = 4,000 sq. ft.

The window area must be computed also. To those on the North wall we will add 15 per cent, the same as we did to the wall itself, due to severe exposure. We will assume that these windows are 8 ft. x 8 ft. and that there are twenty of them on each side of the hangar. Then for North windows we have 20 × 8 ft. × 8 ft. × 1.15 = 1,472 sq. ft. South windows 20 × 8 ft. × 8 ft. = 1,280 sq. ft.

Again referring to the dimensions shown in Fig. 2 and Fig. 3 we see that the roof area will be (26 ft. + 25 ft. + 25 ft. + 26 ft.) × 200 ft. = 20,400 sq. ft.

If we used these figures as they now stand to determine our heat loss it would be incorrect because we have the area of the windows considered twice, once under their own heading and again in our wall area calculations. The total window area should be deducted from the total wall area to get the net wall area.

This also applies to the area of all doors. However, for the sake of brevity and to simplify our problem we will assume that the large doors at each end of the hangar are of a material having the same rate of heat transmission as the walls. This will allow us to leave the area of these doors included in the area of the West and East walls.

These areas that we have computed may be tabulated as follows:

Volume		500,000 cu. ft.
North wall	4,600 sq. ft.	
West wall	2,750 sq. ft.	
East wall	2,750 sq. ft.	
South wall	4,000 sq. ft.	
Total		14,100 sq. ft.
North windows	1,472 sq. ft.	
South windows	1,280 sq. ft.	
Total		2,752 sq. ft.
Net wall (total wall-total window areas)		11,348 sq. ft.
Roof area		20,400 sq. ft.

The next step is to determine the rate of heat transmission through the various materials used in the construction of the building. We will assume that the walls and also the roof of the hangar consist of wood tongue-and-groove sheathing one inch thick with corrugated iron on the outside as shown in Fig. 4. The windows we will assume to be single glazed solid metal sash.

Referring to the heat transmission table previously mentioned we find that the basic factor (70 deg. F. difference) for this type of wall is 45. Similarly the basic factor for the windows is 90.

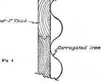


Fig. 4

We will assume that the lowest temperature likely to be experienced during the winter months in the locality of this airport is 0 deg. F. and that we wish at that time to maintain a temperature of 60 deg. F. inside the hangar.

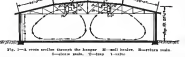


Fig. 3—A cross section through the hangar. H—wall heater. R—return main. S—steam main. T—trap. V—valve

Our temperature difference between inside and outside then will be 60 deg. F.

As the basic factors we have selected for wall and windows are for a 70 deg. F. temperature difference, while our actual condition calls for a 60 deg. F. temperature difference, we must now apply a correction factor. Referring to the table of these factors we find that the correction factor for 60 deg. F. is 0.82.

The correct factors we must use therefore, will be:

For wall	$45 \times 0.82 = 36.90$
For windows	$90 \times 0.82 = 73.80$

In other words, each square foot of exposed wall surface in the hangar will transmit 36.90 B.t.u. per hour and each square foot of exposed window will transmit 73.80 B.t.u. per hour when the outside temperature is 0 deg. F. and the inside temperature is 60 deg. F.

Inasmuch as the roof is of exactly the same construction as the walls we can also use the wall factors for the roof. Therefore, each square foot of roof will transmit 36.90 B.t.u. per hour when the temperature conditions are the same as outlined above.

It has been definitely established that one B.t.u. is sufficient heat to raise the temperature of one cu. ft. of air 55 deg. F., or it will raise the temperature of 55 cu. ft. of air 1 deg. F.

The amount of heat required to raise the temperature of a given volume of air through any given temperature rise them is:

$$B.t.u. = \frac{VTr}{55}$$

Where V = Volume of air to be heated
Tr = Temperature rise in degrees F.

We now have all our factors and are therefore ready to compute the heat loss, or the amount of heat required to warm our hangar. This process may be tabulated as follows:

Volume	=	500,000 × 60 ÷ 55 =	545,500 B.t.u.
Windows	=	2,752 × 73.80 =	203,100 B.t.u.
Net wall	=	11,348 × 36.90 =	418,750 B.t.u.
Roof	=	20,400 × 36.90 =	752,750 B.t.u.
		Total =	1,920,100 B.t.u.

There is one thing more that must be taken into consideration. That is the infiltration around the big doors and windows. There will always be found around all doors and windows cracks of varying sizes through which cold air from outside may filter into the building. Thus the term "infiltration." To determine the heat required to offset this is a very difficult task if it is done accurately.

There are innumerable different types of doors and windows on the market and probably no two could be found that have the same characteristics as far as infiltration is concerned. It is obviously impossible for us to go into the characteristics of all these different types of doors. This is one of many details that must be studied carefully on each individual airport installation.

For the purposes of this example we will assume that the heat required to offset infiltration around the doors and windows amounts to 240,000 B.t.u. This we must add to the total we have already determined. The total heat required for each hangar after all features of the building have been taken into consideration will be 1,920,100 B.t.u. + 240,000 B.t.u. = 2,160,100 B.t.u. per hr.

Before we can proceed further we must decide what type of heating system we are going to install, that is, whether it will be a high pressure steam system, a low pressure steam system or a hot water system. In practically all cases it will be preferable to install a steam system. Local conditions, the availability of competent operating engineers, the size of the installation and many other details must be considered before a decision is made as to whether it shall be a high pressure or low pressure system. Generally speaking a low pressure system is more simple, easier to operate, chraper to install and chraper to operate.

There are certain localities in the West where hot springs abound and many establishments that are within a reasonable distance from them have piped this hot water to their buildings and use it for heating purposes. Any airports that are so fortunately situated could well do the same. However, these cases are on the whole very rare so it will not be advisable for us to go into that further.

In the majority of cases a low-pressure steam system will be found most desirable so we will assume that we have given the matter careful consideration and have found this to be the case in the system that we are designing.

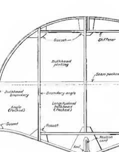
Direct cast iron radiation is generally assumed to give off 240 B.t.u. per square foot of surface per hour. When direct radiation is mentioned it refers to the ordinary cast iron radiator that is generally found in office buildings, apartments, residences, etc.

We have determined the total amount of heat in B.t.u. required per hour to maintain the desired temperature in the hangar. To convert this to the number of square feet of direct radiation required is a very simple matter. We know the amount of heat required and the amount given off by each square foot of direct radiation. Therefore it is only necessary to divide our total heat loss in B.t.u. per hour by 240 B.t.u. Thus, 2,160,100 B.t.u. ÷ 240 B.t.u. = 9,000 sq. ft. of direct radiation.

It might be well to mention that the reason it was necessary to determine the type of system we were going to use before proceeding with this operation was due to the fact that the heat given off per sq. ft. of direct radiation depends on the heating medium used. The heat emission when low pressure steam is used has been stated above. If hot water was to be used this figure would be less. While if high pressure steam was used it would be higher.

WATERTIGHT *Subdivision* OF SEAPLANE *Hulls* AND *Floats*

By Lieut. Comdr. Wm. Nelson, (CC), U. S. N.



Drawing of a section of a watertight bulkhead in a metal hull The joints such as the seams, are packed and riveted so as to make them watertight. The stiffeners and gussets are not packed and have non-watertight rivet spacing

THE NECESSITY for watertight subdivision of any hull or float is predicated on a need for a relatively high degree of safety to personnel and material when that hull or float is in its appointed use Damages to a hull or a float which will impair a part of the watertight integrity may occur from one cause or another during use, and it is with the intention that such damages should be localized that watertight subdivision is employed

Seagoing ships are dependent on maintaining buoyancy and stability at all times to avoid foundering Consequently, if the underwater part of a ship is damaged so as to cause flooding of one or more compartments it is essential that the flooding be controlled or limited without complete loss of buoyancy or stability The degree to which the buoyancy and the stability can be retained will determine the relative safety that will accrue Naturally, then a ship which is divided into many watertight compartments is not as likely to be lost due to underwater damages as one which has fewer compartments of larger size.

Past experiences with damaged ships and convenience determine the amount of subdivision which is to be incorporated in a seagoing ship Warships are minutely divided, whereas merchant ships have a few large compartments Warships are designed with a view to retaining stability and buoyancy in cases of severe damage whereas merchant ships are designed with the understanding that the hazards causing damages are to be avoided There are many variations, but in most designs a sort of middle course is pursued

Seaplane hulls and floats may be considered in various classifications and in various combinations Usually we find two or three floats making the set, the most ordinary combination being one main float or hull with two wing tip floats Some flying boats utilize a main hull of relatively large proportions for the buoyancy, and two smaller floats for stability and secondary buoyancy Another type of flying boat and one which is more common, has the main hull for buoyancy and two small wing tip floats for stability The central float type of seaplane utilizes a main float entirely enclosed and two wing tip floats The twin float seaplane has two main floats and no wing tip floats

The primary function of the floats of a seaplane is to give buoyancy to the seaplane during the time it is in the water It is an inherent essential also, that the buoyancy be so placed as to give stability to the whole The main object is attained by making the bottom, sides and decks of the floats as a whole or in part, watertight As soon as the watertightness of any part that is essential is destroyed, some buoyancy is lost and the primary function is in part nullified

In order to make it practicable to operate a seaplane while it is afloat, some reserve buoyancy is essential This reserve buoyancy is also essential to insure a degree of safety in case of damages to the hull And it is with the object of preserving some of this reserve that subdivison of the floats becomes a matter of concern.

A set of floats for a seaplane, due to their arrangement, give stability to the seaplane as a whole as well as buoyancy The matter of stability for each float is not of vital importance however and is of minor concern in considering the question of subdivision. If the buoyancy of each float is maintained, sufficient stability will be inherent in the arrangement as a whole, under most circumstances likely to be met

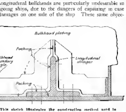
As a general rule it might be stated that the greater the subdivision of a float the less the loss of buoyancy in case of damage In order to arrive at the most logical amount of subdivision, it is necessary to make assumptions as to the extent of possible damages to the floats. The watertight integrity of a float might be impaired, due to collision grounding, stress failure fatigue failure, gun fire, seas entering ports etc The most likely cause of failure is collision with some floating or submerged article while taxiing, taking off or landing It is therefore advisable to limit our considerations to this factor alone and assume that other matters are circumscribed or are too remote to warrant special attention.

It is desirable but not necessary that the seaplane be capable of taking off and landing again when damaged. It is necessary, on the other hand that the seaplane remain afloat when damaged The limit then to the damage which can be incurred is set by the necessity that some buoyancy be available at all times so that the seaplane might be taxied to a place of safety

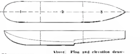
The reserve buoyancy provided in present-day seaplane floats varies from 50 to 120 per cent This variation is permissible considering the various services to which seaplanes are put, and that those services determine the amount of reserve buoyancy to be given a particular design Where the reserve buoyancy is relatively small the subdivision should be more extensively carried out than where the reserve buoyancy is large If damages are incurred by a float in which the reserve buoyancy is small, such damages must be localized so that as much buoyancy as possible is retained both from the operation point of view as well as from the flotation maintenance point of view If we consider two seaplanes alike excepting for the size of floats and regard one as having 50 per cent reserve and the other 100 per cent reserve buoyancy, it can be readily seen that the permissible losses due to flooding of compartments is in the ratio of 1 to 2 and that the subdivision should be in the inverse ratio

The depth of floats now in use is not sufficient to warrant any horizontal watertight subdivisions It is believed however, that the advantages of a double bottom in flying boats for the stowage of fuel, merit the attention of designers However, for the present we are dependent on longitudinal and transverse bulkheads for producing the desired compartment arrangements It is not essential that bulkheads extend to the deck, partial bulkheads being of considerable value and warranted under some circumstances

Longitudinal bulkheads are particularly undesirable in sea-going ships, due to the dangers of capsizing in case of damages on one side of the ship These same objections are non-existent in seaplane floats, and since longitudinal bulkheads are of benefit in other respects, their use appears to be justified The principal objection that might be made is that an unusual list will accompany the flooding of a compartment on one side of a main float, but unless the flooding extends to several compartments on the same side the list can be met without undue dangers



This sketch illustrates the construction method used to insure a watertight joint at a bulkhead where the longitudinal stringer is continuous, running through it.



Above Plan and elevation drawings of a main seaplane float showing the arrangement of the bulkheads which divide the float into three compartments Below: Sketches to show the placing of the bulkhead in a wing tip float

Before proceeding farther, it might be well to discuss the matter of watertight construction. There appears to be no argument in that the shell of the float shall be made absolutely watertight, or so nearly watertight that the amount of water which enters in the course of ordinary operation is negligible Bulkheads, on the other hand, are not subjected to water, except in unusual cases These cases may be rare or not at all Nevertheless when they must serve it is highly desirable that they function efficiently for there is more at stake then than there is at any other time The designs and the methods of construction now in use are not conducive to producing absolute watertightness in bulkheads without unusual expense and without adding undue weights Accordingly it seems prudent to regard a bulkhead as satisfactory if it is light-tight In cases of metal constructions, through members should be avoided if practicable, and if they are required, stapling on at least one side of the bulkhead should be the rule Packing should be used throughout Controls and pipe lines should pierce the bulkheads at the highest part of the bulkhead, or they should be fitted with proper stuffing boxes In general it can be stated that a very reasonable attitude must be adopted to insure that a watertight division is properly designed, and that the design is effected in the construction Careful inspection of the construction and test

with a light will determine whether or not the division will serve its purpose

Consider first the subdivision of wing tip floats The principal object in retaining buoyancy in a wing tip float is to give stability to the seaplane This stability would not be reduced to a danger point if as much as 50 per cent of the buoyancy of a wing tip float were removed Further, if a wing tip float were damaged, it is not likely that the nature of the damage would entirely destroy the buoyancy of that float even though it were a one compartment float The design of wing tip floats is such, however, that it is convenient to make them two or three compartment floats without affecting other factors materially A center line bulkhead as an extension of the keelson will make a two compartment float, and transverse bulkheads at the strut points will make a three compartment float. In no case, does it appear necessary or advisable to go beyond three compartments, and in the majority of the cases a center line division is ample Small wing tip floats need have no bulkheads if weight and cost are reduced thereby.

In a central float type of seaplane, the buoyancy is dependent on the main float, and such subdivision as is undertaken in this float is for preserving a degree of reserve This type of float has a reserve buoyancy of 80 to 100 per cent, and under these circumstances, it is logical to consider three or more compartments as being essential. It is convenient, from the strength point of view, to have complete transverse bulkheads at the strut points Additional transverse bulkheads in a float of this type increase both cost and weight However, a longitudinal centerline bulkhead can he utilized effectively to give a longitudinal strength to the float, and if it is made nominally watertight it serves also to produce a six compartment float without undue cost There are cases where a longitudinal center line bulkhead is not fully warranted, and where more than three compartments are desired Under those circumstances, an additional transverse bulkhead placed between the forward strut points and the bow is in order

The plan and side elevation drawings of the hull for a flying boat Note the bulkhead arrangement

Twin float seaplanes have an inherent division initially Additional divisions are, however, regarded as necessary, and it is not considered illogical to divide these floats in the same manner as is done with the main float of the central float type seaplane The factor of stability is, however, more important in the twin float than in the single float, since any reduction in the buoyancy of one of the pair causes material reduction in stability The convenient subdivision of this type of float by complete transverse bulkheads at the strut points with a longitudinal bulkhead extending practically the full length, is regarded as satisfactory.

The secondary floats of a triple float flying boat act more or less as wing tip floats, and although relatively larger in size than wing tip floats, their subdivision into more than one compartment in the same manner as wing tip floats seems to meet requirements Due to their size, however, and owing to a need for accessibility, the division of this type of float into a three compartment affair by means of two transverse bulkheads, is believed to be superior to a two compartment arrangement, produced by a longitudinal centerline bulkhead

Flying boats are taking relatively large proportions with many features incorporated into the hull which call for special consideration in studying the subdivision to be used One of these features is the matter of permeability Due to its character, the flying boat hull is used for accommodation to the usual fuselage items as well as the whole of the useful load Consequently, when a compartment of a flying boat is flooded due to damages, the volume occupied by water is something less than the volume of the compartment, due to materials in the compartment The ratio of these volumes is termed "permeability." Different compartments will have different permeability, and consideration to it must be given in calculating losses in buoyancy, due to flooded compartments

Communication between the various compartments in a flying boat hull is usually necessary This introduces the question of using watertight doors No answer can be given here as to their effectiveness but consideration to partial bulkheads and watertight decks should be given to obviate a complete watertight door system It seems logical that double bottoms in a part of the hull would be relatively effective in localizing damages without introducing complications

Some transverse bulkheads are practically essential for the proper strength in flying boat hulls The number which can be efficiently provided depends somewhat on the size of the float under consideration In the ordinary 15 000 to 20,000 lb flying boats, at least four bulkheads can be used to advantage Beyond that it depends on the conditions

Longitudinal bulkheads on either side of the passageway in the midship portion can also be effectively utilized Beyond the midship portion the compartments are too small to warrant the use of longitudinal subdivision, excepting below the deck.

A factor which bears on the subdivision of flying boats is the character of the service to which it is to be put Most flying boats will very likely be called upon sooner or later to weather moderate seas at great distances off shore This introduces an extra hazard that is not met with smaller seaplanes and accordingly requires greater subdivision than would otherwise be the case Also, since their seaworthiness is to some extent dependent on how well the deck of the hull can be closed up, means should be provided for closing deck openings with watertight hatches readily placed

Flying boat hulls should therefore be designed having at least six and perhaps as many as twelve compartments to meet properly the requirements of safety

The demands for larger seaplanes and the introduction of seaplanes generally into commercial services where the responsibilities for safety are of paramount importance requires that designers look carefully to this item of watertight subdivision which has a place of prominence in marine work generally Convenience will undoubtedly determine the extent to which subdivision can be adopted but other factors should be regarded as most important until experiences prove otherwise

THE PT-2 TRAINING *Glider*

By John T. Nevill

A flight picture of one of the PT-2 training machines developed by Gliders, Inc.

SOMETHING DIFFERENT and highly interesting in the way of aircraft manufacture is the work of Gliders, Inc, builder of gliders and soarers, in Orion, Michigan, near Detroit

Gliders, Inc, headed by W J. Scripps, son of the publisher of the *Detroit News*, was organized in Detroit last October as part of a multi-sided general program to revive and popularize the science and sport of engineless aviation in America Since going into actual production the company has turned out approximately 20 training type gliders on which type their efforts are centered, and at the present time have under construction two of the more advanced or soarer types The advanced type is constructed on special order only, and sold only to qualified glider pilots, according to Frank M Blunk, the general manager and chief pilot of the company Blunk served in the American air service during the World War, and took his gliding training from Captain Paul Roehre, director of the Rhon-Rossitten gliding school in Germany, at Cape Cod, Massachusetts, last year Captain Roehre was one of three noted German gliding and soaring experts brought to this country at that time by J C. Penney, Jr, in an effort to re-introduce the long shelved sport

Frank M Blunk, general manager of Gliders, Inc., about to go aloft in one of the training craft

That their products might be as efficient as possible Gliders, Inc., several months ago retained the services of Oscar Kuhn, German aeronautical engineer, and graduate of Oldenburg Academy, Germany Kuhn is both an airplane and glider pilot licensed under the "A," "B" and "C" system of Germany Prior to coming to America just four months ago he was with the Caspar Flying Works of Travemunde, and also with the Lufthansa and Rohrbach interests of his native land

M A Kearney is vice-president of the firm, and R W Duncan production manager

THE TRAINING GLIDER on which type Gliders, Inc, is concentrating is very similar in design to the Rhon-Rossitten training glider used on a number of notable flights by Ferdinand Schulz, famous German gliding authority The **PT-2**, by which designation the company's present product is known, is an improved model of the initial product, known as the PT-1

In designing the PT-2, Mr Kuhn has reduced the glider's weight from 210 lb to 175 lb, by reducing the size of the spars and fuselage members. In doing so, it is claimed, the structure has been strengthened, rather than weakened

The **PT-2** is of the high wing, single longeron, one place, open type, the wing panels being externally braced only with flying and landing wires All wood employed is Sitka spruce, except for the skid, which is ash and structural braces, which are oak

The PT-2 has a length overall of 17 ft 5 in, whereas the PT-1 was 16 ft 6 in in length The wing span is

34 ft. Except for a slight cutting away at the leading edge of the wing tips the wings have a uniform chord of 5 ft., giving them an area, including ailerons, of 170 sq.ft The ailerons area, alone, is 23 sq.ft

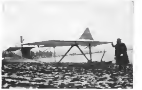
A modified Gottingen section is used for airfoil. The wings are in two panels, joined to the base of a triangular flat, and covered cabane by means of slide fittings and two $\frac{3}{8}$ in. S.A.E. bolts on each panel. All metal fittings on the glider are of cold rolled steel of varied thickness

INTERNALLY, each panel is made up of 17 double ribs spaced approximately $12\frac{1}{2}$ in. apart. The end ribs are composed of two double ribs, covered with plywood cap strips, all gussets in the wing structure being of birch. Birch plywood $\frac{1}{16}$ in. thick also is used to cover the leading edge. This plywood is glued on and tacked for safety. Drag wires are of 0.049 piano wire, tightened with turnbuckles.

All wing spars are spruce, the front spars $\frac{3}{4}$ in. thick, 5 in. deep, and 17 ft. long. Those in the rear are of the same dimensions, except that they are only 3.7 in. in depth. The wings are covered with fine muslin. Size 0.095 piano wire is used for landing and flying wires.

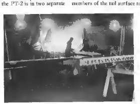
With the idea of minor crashes on the part of student pilots in mind the fuselage of the PT-2 is in two separate assemblies. The "nose piece" carries the pilot's seat and control system. From the rear of the seat aft is the main fuselage, an assembly attached to the nose piece by means of four oak side braces, bolted for easy repair. All vertical and diagonal members of the fuselage structure are glued and nailed together, with $\frac{1}{8}$ in. plywood gussets bracing all joints.

The longeron on the PT-2 is of $1\frac{1}{2}$ in. by $2\frac{1}{2}$ in. spruce. In constructing the fuselage with a single longeron, designers of the glider say they were guided by the results of a series of tests which led to the conclusion that the single longeron was less susceptible to breakage in landing than the triangular fuselage



A front quarter view of the PT-2 training glider showing the stick and rudder control which is similar to that of an airplane

Conventional push and pull controls, similar to those of the ordinary power driven airplane, have been installed. The pilot's seat is of $\frac{1}{2}$ in. plywood and the rudder bar has an ash center, covered with plywood. All members of the tail surface assemblies are glued together, and include full ribs at stress points. In area the tail surfaces comprise approximately 13 per cent of the wing area. Because of the natural vertical surfaces on the fuselage the PT-2 has no vertical fin. The triangular shaped stabilizer is bolted to the fuselage, with two $\frac{1}{4}$ in. bolts through the upper longeron, and braced with piano wire.



A portion of the factory of Gliders, Inc., devoted to wing construction. The uncovered structure of one of the panels about to be taken to the finishing department is shown

The Gliders, Inc., PT-2 sells for \$550 f.o.b. Orion, and initial instruction is provided with every craft. The company, according to Mr. Blunk, has a distributor system over the country, and has delivered gliders to two of the leading universities of the nation, as well as to a number of private gliding and soaring clubs.

Although the company's plant is located in the business center of Orion, rights to considerable acreage in highly adaptable hills surrounding the village have been obtained for testing purposes.

Specifications, as furnished by the manufacturer, are as follows:

Type	High Wing
Span	34 ft
Chord	5 ft
Weight	175 lb
Length over all	17 ft 5 in
Height	8 ft
Static gliding angle	1:12
Wing area	147 sq.ft
Aileron area	23 sq.ft
Tail surface area	22 sq.ft
Construction	Wood and fabric
Airfoil section	Gottingen (modified)
Price (f.o.b. Orion)	\$550

The wing finishing department in the plant of Gliders, Inc

FACTS ABOUT AIRCRAFT FACTORY *Personnel*

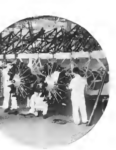
By CLINTON JOHNSTON
Employment Manager, The Glenn L. Martin Company

IT IS a well known fact that success in any endeavor depends largely on the human element. Aviation is no exception. Upon the manufacturer falls a great share in proving aviation a workable everyday utility, and to do so he must ever create various new designs anticipating the requirements of the air line operator, the private owner, schools, and other users of aircraft. In meeting this obligation the selection, training and proper placement of personnel is an important factor.

The enormous increase in the manufacture of aircraft in the last three years has brought about personnel conditions in some quarters which have had a tendency to retard growth, and no part of the manufacturing problem is more acute than engineering. Until a few years ago aeronautical engineering was practiced chiefly in the development of military aircraft. Very few strictly commercial concerns included a complete engineering department in their organization.

However, in the majority of both military and commercial factories and repair shops, forces of trained workmen were maintained, although with the exception of a few large strictly military manufacturers, there was little attempt at specialization until the need became apparent through overtaxing of equipment and personnel resulting from the extremely heavy demands of recent years. It was common practice generally in the small production shops for a single group of mechanics to build all parts of the plane, each working with the other for the completion of the various units without particularly studied regard for time consumed.

Everyone realizes the extreme need for careful, safe workmanship in aircraft fabrication from the smallest part to the final assembly. Inspection has always had a very definite share in aviation and this function was also carried on without regard to specialization. In many instances the inspection requirements were assigned to the foreman on the job. The importance of attention to detail by the individual workman cannot be over-emphasized and there have been found in our own shops many ways of accomplishing this purpose.



Engine installation at one of the Fokker plants

In our former Cleveland plant the beginning of a production contract for one hundred or more military airplanes to be completed on certain pre-determined dates required the assembling of a force of around 1,200 men from a nucleus of a much smaller figure. Obviously it would be impossible to build up such a force entirely of experienced aircraft mechanics in the time allowed. However, as early as 1917 the production requirements for the original twin-engined Martin Bomber were such that our management instituted specialization to some degree at the very outset of activities. The development of this system in the ensuing years has resulted practically in the elimina-

A view of the wing covering department in an airplane factory. Women are generally employed for this type of work

tion of the so-called general airplane mechanic in our plant and the substitution of skilled specialists in the 55 different trades employed.

In quantity production manufacturing it has been proved that men with previous aircraft experience unless specialized, are more difficult to fit into production jobs and less valuable at the start than the sheet metal worker, tool maker, machine operator, etc, who has never before come in contact with airplane work. Such tradesmen depend for a livelihood upon excelling in their respective lines and bringing as they do, valuable experience in some particular kind of work, are capable of much greater output under equal supervision than general airplane mechanics without previous experience in the particular job on which they might be placed.

Before wings can be hung on a plane, an engine installed and tested, a great amount of detail work must be accomplished. This fact is often overlooked by young men contemplating aircraft factory work for a vocation, and only the work of final assembly appeals. Actual final assembly of airplanes on a quantity production basis is perhaps the simplest of all operations involved in manufacture, and while agreeable as an occupation, does not always afford the highest returns. It is in the making of hundreds of small parts and their subsequent sub-assembly that the real need for skill exists long before the plane itself begins to take form. We find it mutually profitable to specialize to a high degree, under proper supervision, jobs requiring skilled artisans in the various trades employed. There is the added advantage that mechanics' helpers can accumulate experience and profit by long contact with one line of work.

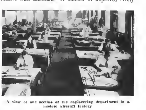
Opportunities for advancement are in no way restricted by this plan. On the contrary the industry is constantly on the alert for potential foremen and executives and in the majority of concerns every opportunity to develop these facilities is afforded. A display of unusual ability cannot but receive due reward whether monetary, advancement in position, or both. Aircraft concerns looking toward the future and foreseeing expansion of their facilities recognize this fact and every opportunity for self-betterment is offered employees. For example, our new plant now under construction at Baltimore, Md with a capacity of 2,500 employees must be properly manned, and competent supervisory personnel will later become one of the determining factors.

There have been instances where designs, manufacturing facilities and capital were brought together in well organized manner, only to find upon beginning operations that properly trained and experienced personnel, one of the major considerations, had not been accorded study equivalent to its importance as a factor in profitable operation. Realization of this condition at once made apparent the need for thorough and far reaching personnel administration, which, logically enough, has led to the development of aviation training centers throughout the country.

An advanced personnel policy having always been a part of our company, the advantage of many years experience materially aids comprehensive plans for flight ground, shop and engineering training which is a well defined part of present expansion plans. The applicant appointed to any of the training divisions will be educated in one particular phase of aviation fitting him for a certain amount of responsibility on finishing. In the Engineering Department of the factory there are planned systematic courses of study providing a medium for advancement from the lower grades to designing, checking and advanced engineering, which may be followed during employment.

The manufacturer's obligation to the future of aviation implies much more than maintaining rigid standards of aircraft construction. The organization and development of new and improved designs will always retain its place in the lead of aeronautical development. Organizations formerly producing but one type of plane are revising and advancing their position through the addition of complete engineering staffs and the evolution of additional types embodying improved performance. Particularly is this true in the military field where all branches of our air services are endeavoring to devise new and more efficient means of transporting men, materials, and explosives under varying conditions.

The Navy's fleets of ship-board fighters and three purpose planes, both recently perfected, are evidence of this advancement. The practical development of the flying boat has been hardly touched but is beginning to receive wide attention. A number of improved Army types have also appeared in the last two years and many other new military and commercial designs, land, sea and amphibion types, are in progress in all sections of the country by both old and new concerns, each endeavoring to exceed previous standards, or establish altogether new types to meet present and future needs in fields now little touched, but which indicate the coming of vigorous aircraft competition. Our organization, among the leaders in this development, is now undergoing a considerable engineering enlargement in keeping with our program of expansion already under way. Aviation has never before presented such opportunities for the exploitation of individual creative ability and rewarded so well the draftsmen and designers who have followed this branch of their profession. Old established technical colleges report greatly increased enrollment along aeronautical lines and a large number of other colleges and universities throughout the country have instituted courses of this type to meet the demand.



A view of one section of the engineering department in a modern aircraft factory

It is an established conclusion that nowhere in industrial America can there be equalled the opportunities aviation offers to keen-minded aggressive young engineers in whom the industry places its trust for future predominance.

Ford Motor Company AND AMERICAN AERONAUTIC DEVELOPMENT

The "Air Pullman" Makes Its Appearance; Ford Starts the Detroit-Chicago Line, and Finally Purchases the Stout Metal Plane Company

By John T. Nevill

The OX-5 powered, four place "Air Sedan" was the first all-metal commercial airplane constructed by the Stout Metal Plane Company. We have previously learned of the many difficulties surmounted by William B. Stout and his associates in the building of the "Air Sedan's" predecessors. There were many more difficulties yet to be overcome.

The "Air Sedan," as originally equipped, proved to be underpowered. Soon after its completion the OX-5 was replaced by a 150 hp "Hisso" With its new type engine the plane was flown at Selfridge Field, where it performed to a very satisfying degree. After that it was used to give more than 300 persons their first flight. It now rests in the Ford museum at Dearborn.

Mr Stout's next problem became one of engine shortage—a problem still existing in the industry in a slightly different sense. In 1923, Mr Stout maintains, there were only three reliable types of American-made airplane engines, those three being the Liberty, the OX-5 and the Hisso. The OX-5 had proven too light for the all-metal "Air Sedan" Hissos were not procurable in practical quantities. Therefore, only two paths remained open if the company wished to produce airplanes in business-like numbers. They must reduce the size of their airplane to befit the 90 hp Curtiss OX-5, or they must enlarge it sufficiently to safely take the 400 hp. Liberty. Mr Stout called a meeting of his directors and explained the situation. Shortage of engines of the 150 hp class was forcing the company into other channels. The "Air Sedan," as designed, must be discontinued. Had the "Air Sedan's" success justified a brand new experiment?

To a man the directors approved Bill Stout's new plan. He had designed a larger all-metal craft to be known as the "Air Pullman" The "Air Pullman," an eight passenger plane, was completed and test flown at Selfridge Field, by Walter Lees, now with the Packard Motor Car Company, who last year flew the world's first Diesel powered airplane, an achievement developed by the Packard company.

William B Mayo, Henry Ford and William B. Stout standing beside the "Maiden Dearborn I" just before the flight that inaugurated the Detroit-Chicago airline

Later the "Air Pullman" was flown by Eddie Hamilton, who was destined to become chief test pilot for the Ford Motor Company. The plane was flown to Chicago with a capacity load and proved to have a top speed of more than 100 m.p.h. It also was flown to Dayton, O., on several occasions.

All-metal construction was still too new a departure from conventional practice to be accepted in the interests of safety and efficiency, and a marketing problem of considerable size presented itself. About the only likely market seemed to lie in the government. The Navy, through Mr. Stout, had experimented with the all-metal idea, and still was skeptical. Since Aug. 10, 1918, the Post Office Department had been carrying the mails by air. Perhaps it might prove a market.

Stout officials still maintain they had to "crack up" the "Air Pullman" in order to sell the idea to the Post Office Department. Early in 1924, the plane, with a party of Detroiters aboard, was flown from Detroit to the National Air Races in Dayton. En route home, through a faulty gas line, the engine caught fire, with the plane several thousand feet in the air. Eddie Hamilton, the pilot, cut the switch, and very skillfully maneuvered the plane down, so that the flames were kept away from the windshield. Striking the ground in a rough and none too large field, the "Air Pullman" plunged through several fences, but came to rest topside up. Except for a few minor cuts and bruises, the passengers suffered no injuries. Damage to the plane was confined to the landing gear and tail. There was one fatality, according to the story—a farmer's chicken was killed.

All of the plane's occupants climbed out and surveyed the damages. Among them was Prof. Edward P. Warner, of the Massachusetts Institute of Technology, who had been commissioned by the Post Office Department to investigate the possibilities of the "Air Pullman" as a heavy duty addition to air mail equipment. Professor Warner was so impressed by the sturdiness of the "Air Pullman" as evidenced in the "crack up," that he stressed that advantage in his report to the Post Office Department. The result of Warner's report was that two weeks later, the "Air Pullman," which had been returned to Detroit and repaired, was flown to Cleveland, and delivered into government service.

Throughout this period Mr. Mayo and the Fords had been watching the Stout developments with keen interest. Mayo spent a considerable portion of his time in the Stout plant. Another circumstance was brewing to make this interest even stronger.

With completion of the first Liberty powered craft Mr. Stout realized his company was becoming a bit pinched for finances. So during the summer of 1924, he wrote a letter to Edsel Ford in which he stated that "three things were necessary to insure the future of aviation in Detroit." Detroit had no airport, he said, so the first essential was the acquisition of a landing field, where commercial development could be carried on without interference, and without dependency on government contracts. The second essential was the erection of a factory building on, or near, the airport, the Stout letter read, and the third was increased development of airplane engines suitable for commercial work.

Judge Kenesaw Mountain Landis congratulating E. G. Hamilton, pilot of the Stout monoplane "Maiden Dearborn I," upon the completion of the flight from Detroit to Chicago, which inaugurated Henry Ford's experimental airline between the two cities. Harry Russell, veteran Ford mechanic, is shown standing betwen Judge Landis and Pilot Hamilton, while Maj. R. W. Schroeder is at the extreme right in the picture

Above: Front quarter view of the "Maiden Dearborn I," the first plane to be placed in service on the Detroit-Chicago airline. This plane was powered with a 12 cylinder Liberty engine. Below: Henry Ford placing the first express package aboard the "Maiden Dearborn I" just before the inaugural Detroit-Chicago flight

Mr. Ford was quick to see the inconvenience and disadvantage of having to haul the company's planes through many miles of streets and roads to a flying field, so, shortly after receipt of Stout's letter he invited Mr. Stout and his colleagues out to Dearborn.

"We have some property out here that might be made into an airport," he said. "Why don't you come out and see what you can do with it?" That was the beginning of the Ford Airport of today.

With Harold H. Emmons, Mr. Stout went out to Dearborn, and helped Edsel Ford pick out a logical site for the proposed field. There proved to be enough Ford owned land in the immediate vicinity of the Dearborn administration building for the selection of three different sites, any one of which could have been developed into a creditable landing field. These sites were numbered one, two, and three. Site number one, an area fairly level, but having an extensive growth of trees, was ultimately chosen. Within a few hours after the site had been selected Mr. Ford had men upon the field felling trees, pulling stumps, and otherwise preparing the plot for the new era.

The Fords kept 25 tractors on the field for nearly six months putting it in shape. By November 1 it had been completed. As it was then it consisted of 260 acres, with two runways, one 3,700 ft. long and one 3,400 ft. long, both 300 ft. wide. Hardly had work on the airport begun, however, before erection of a small factory building on the site was started. The building was to be leased to the Stout Metal Plane Company for a small nominal fee. A formal announcement appearing in the Ford News of July 15, 1924, explained the project as follows: "For the purpose of encouraging aircraft development the Ford interests will erect a modern factory building devoted to research in aviation. The buildings will be used by the Stout Metal Plane Company and the Aircraft Development Corporation."

The building was completed and moved into late in 1924, and on Jan. 15, 1925 the airport was dedicated, part of the dedicatory program consisting of a visit by Maj. Thomas G. Lanphier and 11 pilots from Selfridge Field, who flew over in pursuit planes. All of the officers dined with the Fords in Dearborn on the occasion.

On Feb. 2, 1925, there occurred in Washington a notable event that was destined to have influence on subsequent aeronautical activities of Ford Motor Company. On that date Congress passed the Kelly Air Mail Act, authorizing the Post Office Department to contract with private airline operators to carry the United States mails.

Coincident with the removal of the Stout plant from Detroit to Dearborn the name of the "Air Pullman" was changed to "Air Transport," a name still used today as signified by the "AT" series now produced.

There occurred at about this time an incident that is significant of Henry Ford's method of getting things started in a hurry.

When the second Liberty powered plane, the first to be completed on Ford's property, had been assembled, the company installed in it the only available engine

immediately at hand Tests on the plane scarcely had been concluded before the engine was sadly in need of an overhaul One Saturday morning, early in April, Mr. Ford, who had purchased the plane, encountered Mr Stout in the corridor of the Ford offices

"I've been thinking about starting an experimental air line to Chicago," he said "How soon can we start such a line?"

Somewhat overwhelmed by the unexpectedness of the query, Stout groped for an answer.

"This is Saturday," Mr Ford continued "Can we start it Monday?"

"No," Mr Stout replied, "because that plane needs a new engine, the one in it is about 'shot,' but we can start it the following Monday"

So, on Monday, April 13, 1925, the world's first regular schedule airline, devoted solely to the business of one company, was inaugurated

Before a few officials of the Ford and Stout companies and several newspapermen, Eddie Hamilton, who had been employed by Ford as chief pilot, took the plane off on its initial flight to Chicago So high was the interest in the new experiment, and so marked was the doubt that everything would go by smoothly, that for nearly a week thereafter Bill Stout and his associates—plus the inevitable newspapermen—gathered at the field every afternoon to watch the big plane return from its "hazardous" trip to Chicago

For purposes of comparison, the Maiden Dearborn I, by which name the first "Air Transport" was known, was 60 ft in span, against 74 ft in the smallest of the three models made today The length was 45 ft against 49 ft 10 in, and the top speed was 110 m p h against 116 m p h in the present 4-AT model

It might be explained that the Chicago line, into which service the Maiden Dearborn I had been placed, was flown only on alternate days With completion of the Maiden Dearborn II, however, it was placed in operation on the Chicago line on April 27, creating daily service. Leroy Manning, former Selfridge Field officer, and present chief pilot for the Ford company, was the alternate pilot over the route

The first five "Air Transports" were purchased by the Ford Motor Company, the Maiden Dearborn III being turned over to them on June 27 With this plane Mr Ford began a new venture Three days after delivery, on July 1, 1925, he opened his Cleveland airline

During this time other developments, worthy of note, had been taking place on and about the airport For one thing, Ford Motor Company installed on the airport a Sperry beacon of 450,000,000 cp—more light than could be produced by the 9,000,000 Ford automobiles then in operation The beacon had a lens 36 in across and was said to have been seen from an automobile 80 mi, distant Another incident, far more significant of what was destined to occur, appeared in an announcement of the Ford company at that time that the company had purchased from the Government 20 of the 3,950 Liberty engines Ford had built for the government during the World War The engines, it was said, were bought back to be placed in planes of the Ford airlines

It developed later that Mr Ford had approached Mr Stout during the month of July, informing him that he and Edsel wanted to purchase the Stout Metal Plane Company, and were willing to pay the stockholders $2 for every $1 they had invested in the Stout concern

"Do you believe you can talk your stockholders into selling?" the elder Ford asked Stout

"My stockholders did not come into our company expecting any profit," Mr Stout replied, "and, for that reason, I do not believe they would be interested in selling They are all men of considerable means and I do not believe a few dollars profit, at the cost of losing their financial interest in the company, would influence them to dispose of their holdings However, most of them are deeply interested in furthering aviation, and they might sell for aviation's sake"

Mr Stout's conjecture proved correct, and on July 31, 1925, the Stout Metal Airplane Company was shut down for inventory, opening on August 3 under the new ownership Mr Stout, Stanley Knauss, Glen Hoppin, George Goin, and all of the others actively employed by the Stout Metal Airplane Company were retained and carried on their duties as a part of the Ford Motor Company Airplane Division

So quietly was the entire transaction carried out that word of the event did not reach the general public until August 8, when the following formal announcement was printed in the Ford *News*, an organization paper, the circulation of which is confined mostly to employees and agents of the Ford Motor Company

"Ford Motor Company became a manufacturer of airplanes July 31 by purchasing all stock and assets of the Stout Metal Airplane Company.

"The building of Stout all-metal planes will henceforth be carried on by the Stout Metal Airplane division of the Ford Motor Company

"Operations will be continued in the factory building at the Ford Airport, Dearborn, where four planes have already been built and others are under construction

"Mr Stout, who developed the present model, after 15 years of experimentation, and was a pioneer in building an all-metal monoplane of the thick-wing type, remains in charge of plane manufacture, while the personnel of expert engineers and mechanics also have been retained

"The Stout plant and manufacturing equipment were purchased by the Ford company for the purpose of accelerating airplane development by backing the work with the diversified resources and experience of the Ford organization

"The scope of experimental operations will be widened, while manufacture of the present type, which has proved highly successful in Ford air freight service, will be continued on a larger scale.

"The Stout plant was closed down Friday, July 31, for inventory, and opened Monday, August 3, under the new management

"The association of the Stout Metal Airplane Company with the Ford organization began less than a year ago, when on completion of the airplane factory built at the Ford Airport, Oct 15, 1924, Henry Ford and Edsel Ford contributed its facilities to the development of the Stout plane, of which only one of the present type then existed

"The Stout plane was selected as being the most highly developed type in America, and because it appealed to Mr Ford as the most logical, dependable and safe"

The fourth of this series of articles by Mr Nevill will appear in an early issue of Aviation

GENERAL NEWS

North American Gets Pitcairn Aviation

NEW YORK (N Y)—Pitcairn Aviation, Inc, representing the flying activities built up by Harold Pitcairn and recently bought by C M Keys in a personal transaction, has been sold by him to North American Aviation, Inc., a holding company of which he is president Mr Keys said he had acquired the company in the first place with the idea of turning it over to one of the units with which it is associated.

The company will give considerable emphasis in the immediate future to a survey of the passenger service possibilities offered by the New York-Miami route on which the Pitcairn company is flying the mail It is expected that the survey will be made while Mr. Keys is in Europe Careful consideration will be given to a proposed change from the present route so that from Richmond the planes would fly along the coast and include Charleston and Savannah.

Bendix Acquires Pioneer Instrument

BROOKLYN (N Y)—Pioneer Instrument Company has been acquired by the Bendix Aviation Corporation, according to a recent announcement of Vincent Bendix, president of the recently organized aviation accessory manufacturing company Charles H Colvin, general manager of the instrument company, will be a director of the Bendix concern

It is expected that the business of the Pioneer company will exceed $1,000,000 this year, according to Mr Colvin The capacity of the plant is being doubled at the present time to about 60,000 sq ft of floor space The company has been in operation ten years and has established offices in Paris, Berlin, Rome, Melbourne and Tokio, beside offices in this country

Army Signs Big Engine Order

WASHINGTON (D C.)—Contracts for engines costing a total of about $2,000,000 were signed by the Secretary of War June 28 for the use of the Air Corps The contract includes 180 Wasps, costing $1,141,052.79 65 Curtiss D-12-E engines, costing $527,405.09 and 54 Wright J-6 engines costing $228,544.49

Miss Earhart Gets T.A.T. Post

NEW YORK (N Y)—Amelia Earhart has been appointed assistant to the traffic manager of T A T Her duties will be to promote air travel among women of this country She will participate in the opening flight starting tomorrow, July 7

Curtiss-Wright Corporation Unites Large Aviation Groups

Genealogy Of "Aviation"

Aviation was founded by Lester D Gardner, the first issue appearing Aug. 1, 1916, as *Aviation and Aeronautical Engineering* In 1920 the *Aircraft Journal* was absorbed and the title became *Aviation and Aircraft Journal*, to be simplified into Aviation in January, 1922 The chief editors have been Ladislas d'Orcy, W Lawrance Le Page, Earl D Osborn and R Sidney Bowen, Jr

The present staff consists of Edward P Warner, editor, R Sidney Bowen, Jr., associate editor, Earl D Osborn, contributing editor, Leslie E Neville, technical editor, Herbert F Powell, news editor, James P Wines, assistant editor, Charles H Gale, assistant editor, and Charles F McReynolds, Pacific Coast editor.

Manufacturing, Sales and Service to be Aim

NEW YORK (N. Y.)—The Curtiss-Keys group of aviation interests and the Hoyt group have joined hands in a $70,000,000 merger announced here last week The consolidating of the two groups will be restricted to manufacturing sales and service activities, however, and will not include any of the transport units, for the present at least

This union, to be known as the Curtiss-Wright Corporation, brings together the Wright Aeronautical Corporation, Keystone Aircraft Company and the Curtiss Aeroplane & Motor Company, with their many associated concerns It has been announced that negotiations for Travel Air and Moth Aircraft are in process

Hoyt Heads Board

Richard F Hoyt, chairman of the board of directors of the Wright Aeronautical Corporation, president of Aviation Corporation of the Americas and vice-president of Hayden, Stone & Company, will be chairman of the board of the new concern. C M Keys, leader in the Curtiss companies, president of T.A.T, chairman of the executive committee of N.A.T, etc, will be president Charles L Lawrance president of the Wright Aeronautical will be vice-president, Glenn H Curtiss will be a member of the technical committee Other officers have not been announced

The purpose of this big pooling of interests, according to Mr Keys, is to eliminate duplication of effort among the several companies, especially as far as research is concerned, and to secure the strength and the various benefits to be derived from co-operative operations. A highly expanded research program is the primary object

The list of companies involved in the deal is as follows: Wright Aeronautical Corporation, Curtiss Aeroplane & Motor Company, Curtiss Airports Corporation, Curtiss Flying Service Curtiss Export Corporation, Curtiss Caproni Corporation, Curtiss-Robertson Airplane Manufacturing Company, Keystone Aircraft Corporation, New York Air Terminals, N Y & Suburban Air Lines

No company, under present plans will lose its identity The Curtiss-Wright Corporation, it has been emphasized, is a holding company only No change in personnel among the companies is contemplated either, it was declared.

(Concluded on page 50)

Testing New Wright 500 Hp. "Vee" Engine

NEW YORK (N. Y.)—An extended series of flight tests are planned for the new Wright twelve cylinder, inverted "Vee" air cooled engine in an experimental all metal amphibion built by the Keystone-Loening Corporation It is reported that the engine is tentatively rated at 500 hp

Following preliminary tests in the vicinity of New York, the plane will be taken to Dayton Ohio where complete engine tests will be held at the Army Air Corps headquarters at Wright Field

Wright Clarifies Names

PATERSON (N J)—Wright Aeronautical Corporation, aircraft engine manufacturer, this city, has announced that the name, "Whirlwind," is a registered trade-mark for some of the radial engines it produces, and that the names of the new J-6 series are, "Whirlwind-Five," the five cylinder, 165 hp engine "Whirlwind-Seven," the seven cylinder, 225 hp model, and "Whirlwind-Nine," the nine cylinder, 300 hp type

Ford to Expand Plant at Dearborn

Plane a Day to be Goal for Production

DETROIT (MICH)—The Ford Motor Company will expand its plane plant by 153 per cent, permitting production of one plane a day, according to plans announced by the company here recently. Work on the extension will begin immediately, it was said.

The enlarged plant will give decided impetus to the Ford production schedule, and will constitute the third increase in production capacity occurring during the present year. Early this year the company's output was increased from two planes per week to an average of three planes for every five day week. The second increase was made several weeks ago, when the company announced the present plant had been arranged so as to be able to manufacture four crafts every five day week.

As it stands today the Ford airplane plant is 500 ft long and approximately 124 ft. wide. The enlarged factory building will be 640 ft. in length and 253 ft. wide.

To Keep Present Plant

All of the present buildings at the airport will be retained and additions made so as to permit on a larger scale the efficient movement of parts toward assembly. All aviation activities will be concentrated in the single factory at Dearborn, it was said. Provision will be made for the production of parts now being made in the River Rouge plant, while facilities for finishing and trimming cabin interiors, now done in the company's large hangar just east of the factory building, will be enlarged so that twelve planes may be handled at the same time.

Architecturally, the plant additions will conform in general appearance to the hangars and the Ford experimental laboratory in the vicinity of the airplane factory, being long and low so as not to constitute interference for incoming or departing planes.

To Double Floor Space

Building plans call for erection behind the present factory of a unit duplicating the present one in size and immediately connected with it, so as to double the floor space of the plant. In addition, on the north end the building will be extended to within about 90 ft of Airport Drive, giving still more floor space. On the North end of the present plant a mezzanine floor will be built, to extend southward a distance of six bays.

The building's exterior will be of the same materials as were used in the present structure. Bedford limestone and fire clay brick with steel sash and doors and cement tile roof. The exceptional lighting arrangements and the ventilation of the present factory will be carried out faithfully in the new buildings.

An entrance at the northwest corner, convenient to the intersection of Airport Drive and Oakwood Boulevard, will admit to the general offices the accounting, employment, and stock departments, the offices of the superintendent and others. The mezzanine floor will be devoted to the drafting rooms, employes' rooms and other uses.

Decision to enlarge the airplane factory and pave way for continued increase in the airplane production program is regarded as the second really important move made by Ford this year in the aviation manufacturing field. The first was the reduction averaging approximately $8,000, in the price of the three types of Ford trimotored monoplanes produced by the company.

The Ford company recently shipped one of its model 5 AT transport planes for exhibition in the International Aircraft show to be held in London July 16-27. Following the exposition it was said, the plane will be piloted over the airways of Europe by Leroy Manning, chief test pilot of the Ford company. This has been interpreted as the company's bid toward the European market. The plane is the first Ford monoplane to be shipped to Europe.

Type Certificates Granted

WASHINGTON (D C)—Three Approved Type Certificates were issued by the Aeronautics Branch for the week ended June 29, 1929: No 166 Bourdon, B-4, 3POLB, Kinner K-5 1107 768, 1875; No 167 Great Lakes, 2T1, 2POLB Cirrus 111, 1002, 578, 1580; No 168 Waco 165 3POLB, Wright R-650 1529, 956, 2485.

> ### *Fairchild KR Has Ceiling of 17,000 Ft.*
>
> The service ceiling of the Fairchild KR 21B is 17,000 ft. instead of 7,000 ft as erroneously stated in the June 1 issue of AVIATION through a typographical error. This opportunity is taken to draw attention to the mistake.

First U. S. Cirrus Tested

CLEVELAND (OHIO)—The first Cirrus engine to be produced in the United States was tested in flight recently in one of the training planes manufactured by Great Lakes Aircraft Corporation according to an announcement made by Col Benjamin F Castle, president of the airplane manufacturing concern. The performance of the engine measured up to all expectations, it is said. Great Lakes Aircraft is a subsidiary of Allied Motor Industries, Inc., as is American Cirrus Engines, Inc, the announcement stated.

Engineers Discuss Aviation Fuel Studies

SARANAC INN (N Y)—A feature of the summer meeting of the Society of Automotive Engineers, held here June 25 to 28 was the presentation of a group of papers on fuels and their effect on engine performance. Of special interest to aeronautical engineers were the data given by Oscar C Bridgeman, of the Bureau of Standards on low-temperature starting without pre-heating of the intake air. Mr Bridgeman indicated a minimum temperature for "fairly easy starting" with Domestic Aviation Gasoline, of 5 deg F. The addition of 25 per cent of ethyl ether to the fuel decreased the practicable starting temperature to —28 deg. F., but further additions of ether had relatively little effect. It appeared from Mr Bridgeman's studies also, that the best of the several natural-gasoline aviation fuels tested would have a minimum starting temperature about 30 degrees below that for straight run Domestic Aviation Gasoline.

The results of work done at the Bureau of Standards on the effect of humidity on engine power were presented to the same session by Donald B Brooks. The general conclusion was that maximum power is always obtained in a dry atmosphere unless the carburetor adjustment be badly in error and that the power loss when flying through fog, or in other conditions of extreme humidity may be as much as 3 or 4 per cent.

Dr H C Dickinson in charge of the engine work at the Bureau of Standards, reported that active progress was being made on the development of a standard method of testing fuels for their anti-knock qualities, but that final results were not to be expected for some months. A number of laboratories are co-operating in the preliminary tests which are being made by running the fuels in a special test engine. This study was undertaken with the object of making it possible to include definite stipulation of anti-knock qualities in governmental and commercial fuel specifications, supplementing the requirements of chemical properties and volatility now enforced.

The meeting did not include any technical sessions on aeronautics, but a general session was addressed by Mr V R. Jacobs of the Goodyear Tire & Rubber Company, who spoke on airship transportation and by Mr Alfred F Masury, chief engineer of the Mack Truck Company, who told of his observations as a passenger in the most recent flight of the Graf Zeppelin.

To Patrol Salmon Grounds

VANCOUVER (B. C)—Three Western Canada Airways planes will perform government patrol work in the coastal fishing area during the British Columbia salmon fishing season. Pilots will have powers as government officials and will check up on infractions of the Fisheries Act.

To Open Cape Cod Glider School July 8

BOSTON (MASS)—A school to teach the piloting of engineless aircraft will be opened at the Provincetown end of Cape Cod July 8 under the auspices of the American Motorless Aviation Corporation, New York, backed by the interests represented by Maj Gen John F O'Ryan. The two German glider pilots, Heinrich Knott, of Darmstadt, and Rolf von Clingensperg, of Munich, will be in charge of flying. They came to America May 13 for a six months contract arranged by the Rhoen Rossitten Gesellschaft, which sent the glider expedition to Cape Cod last year.

Actual gliding activities will begin the middle of June and a number of powered craft pilots will be allowed to try for glider pilot ratings before the school opens. Maj Vergne Chappelle, Field Artillery Reserve, and Maj C A Doll will be in charge of the glider camp. Arrangements are being made whereby flying schools may send their students for preliminary glider work.

The term of residence will be based on two-week units the charge for which, including board room and flying will be $150.

The State of Massachusetts will license glider pilots for commercial purposes, such as serving as teachers of gliding. But it will require that a man qualify also as a powered plane pilot. No state license will be required for men doing gliding on the land under lease to the American Motorless Aviation Corporation.

Completing Marchetti Motor Plant

SAN FRANCISCO (CALIF.)—Marchetti Motor Patents Inc of this city expects to move into its new plant adjoining Mills Field in a few months.

Bach Recovering from Fire

LOS ANGELES (CALIF)—At the Metropolitan Airport, reconstruction of the unit of the Bach Aircraft Company which recently was destroyed by fire is progressing rapidly. It is expected that the output will be delayed only from three to four weeks.

To Hold Glide Events at Air Races

CLEVELAND (OHIO)—At least eight glider events are reported assured for the Second National Glider Conference and race program to be held in conjunction with the National Air Races, August 24-September 2.

Among the leaders in gliding attending the conference will be E. S Evans, of Detroit, Anthony H G Fokker builder of the first two place glider Dr Wolfgang Klemperer, Germany's pioneer glider expert and holder of glider license No 1 there. Amelia Earhart first American woman to fly a glider, Prof Peter Altman of the University of Detroit, department of aerodynamics, M. S Stoughton of the University of Michigan and Franz Gross who built the Darmstadt soarer which made a world's record of 42 mi over the Rhine valley. Gross now located in Akron Ohio is building a duplicate of the Darmstadt which is to be flown in this country.

Secures Rumpler Rights

BOSTON (MASS)—American rights for the manufacture of the German Rumpler all-metal airplane have been acquired by the Eastern Aircraft Company and a site has partially been decided upon for a factory at Pawtucket R I. Here will be manufactured an all metal plane built especially for the American market.

Official Report Shows Civil Aeronautics Progress

WASHINGTON (D C)—The following statistics have been revealed by Secretary of Commerce Lamont in a report covering the first three years of operation of the Aeronautics Branch, which was established July 1 1926.

	Dec 31 1926	Dec 31 1921	Dec 31 1928	Estimated July 1 1929
AIR TRANSPORT (Scheduled)				
1 Airplane miles flown	4 318,087	5 870 409	10 500 000	8,000 000
2 Airplane—miles flown daily average	10 839	16 093	26 606	70 000
3 Miles of airways	8,404	9 121	16 667	30 000
4 Miles of lighted-airways	2 041	4 460	6 988	10 000
5 Passengers carried for hire	5 782	8 679	35,000	40 000
6 Express and freight carried (lbs)	1 733 090	2,263 580	2,010,000	1 200 000
7 Total mail carried (lbs)	810 055	1 654 165	4 061 210	3 400 000
8 Number of transport operators	14	19	31	45
9 Airplanes in service	69	128	300	400
MISCELLANEOUS				
1 Airplane miles flown (not including airway operations)	18,746,640	30 000,000	60 000 000	
2 Pilots licensed or pending	0	3 242	5,605	6 735
3 Student pilots permits issued or pending	0	545	9 983	8 081
4 Airplanes licensed or pending	0	2 299	4,156	5,017
Airplanes identified or pending	0	851	2 764	2,989
5 Private and commercial airports		263	391	410
6 Lighted intermediate fields	92	134	210	282
7 Municipal airports		240	412	424
8 Proposed airports		422	926	1,032
9 Radio communications stations	17	19	29	34
10 Weather Bureau airway stations	12	25	55	125
11 Value of airplanes produced	$6,871,027	$14 504 999	$43 812 310	
12 Total value of all air products produced	$17 094 905	$21 161 853	$64 662 491	
13 Number of concerns engaged in air industry	600	900	1 400	1 950
14 Approved models of airplanes	0	21	96	165
15 Approved models of airplane engines	0	0	13	25
16 Number of aviation schools	175	375	475	515

Hawks Establishes Three New Records

Crosses Continent Twice in Lockheed

ROOSEVELT FIELD (L I)—Establishing three new transcontinental flight records Capt Frank M Hawks, director of the aviation department for the Texas Company, landed his Pratt & Whitney "Wasp" powered, Lockheed "Air Express" monoplane here at 12 16:03 a m Eastern Standard Time, Saturday, June 29. He had left the airport 44 hr 3 min and 2 sec earlier, had flown to the Los Angeles Metropolitan Airport, Los Angeles Calif, and returned. The actual flight time for the trip was 36 hr, 48 min., and 48 sec.

Captain Hawks arrived at the field here to start his record breaking flight shortly before 4 a m Thursday June 27. The Lockheed loaded with 615 gal of fuel was awaiting him on the runway. Just before taking off however, he decided to reduce the gasoline load to lighten the plane and 65 gal were removed from the tanks, leaving 550 gal with which to make the non-stop hop to Los Angeles. This was 75 gal more fuel than he carried on the record breaking West-East flight which he made last winter. Col E M Roberts representing the National Aeronautic Association, placed a sealed barograph in the plane. Hawks took off at exactly 4 12 51 a m.

Shatters All East West Records

Nineteen hours ten minutes and thirty-two seconds later the Lockheed Air Express was landed at the Los Angeles Metropolitan Airport completely shattering the transcontinental East-West flight record set by the late Capt C B D Collyer and Harry Tucker of 24 hr, 51 min. Captain Hawks planned when he took-off to remain only an hour at the Los Angeles field. Some minor adjustments on the engine and some slight repairs on the plane were necessary though, and he was forced to stay there for 7 hr 14 min, and 14 sec which prevented his making the round trip within 36 hr.

The take-off on the return flight was made at 3 37 47 a.m Pacific Standard Time or 6 37 47 a m Eastern Standard Time. On the way back, he succeeded in breaking his own non-stop West-East transcontinental record of 18 hr 21 min and 59 sec established in February by making the trip in 17 hr 38 min. and 16 sec. He landed his plane at Roosevelt Field at 9 16 03 p m Pacific Standard Time Friday, June 28 or 12 16 03 a m Eastern Standard Time, Saturday June 29.

It is interesting to note that, in addition to breaking the non-stop East West transcontinental flight record Captain Hawks also succeeded in breaking the record formerly held by Lieutenant Maughan who flew a Curtiss PW 8 with three stops en route, from Mitchell Field L I, N Y, to San Francisco in 21 hr 48 min and 30 sec.

Cessna Has Quota Of 545 to 1930

Large Production Planned For Balance of the Year

WICHITA (KAN.)—Wichita's production goal of 2,000 planes for 1929 was given a substantial boost with announcement that the Cessna Aircraft Company will undertake a schedule in its new factory calling for 545 machines during the balance of the year.

Practically the entire output is being absorbed under the sales contract with Curtiss Flying Service, which calls for the delivery of more than 500 planes by 1930. Under the new schedule, 27 will be built each week at this time, with 40 possible each week with night shifts, according to Maj. Howard Wehrle, general manager.

Built 47 Planes in Three Months

Forty-seven cantilever wing monoplanes were turned out at the old factory here during the past 90 days. Hugo A. Kenyon of Boston, vice president and a director of the Cessna company, has returned to the East to complete arrangements for supplying the new plant with the large quantities of material which will be necessary, if the new production schedule is to be maintained. The new factory, with a floor space of more than 50,000 square feet, was erected at a cost of $200,000.

Other Wichita factories also are speeding up production. With the opening of Travel Air's new units, that company is working toward a 50-plane-a-week schedule. Nearly half the company's output are six-place cabin monoplanes.

To Produce Thirteen Weekly

Swallow also has opened a new factory unit and plans to speed up production to around ten training planes and three-place standard biplanes weekly.

Stearman, with a change in models now in progress, has not set a definite production schedule for the balance of the year, but officials of the company expect to turn out twice as many planes this year as last. Four are being turned out weekly.

The Knoll concern expects to move into its new big factory east of Wichita early in July. Four planes have been built at the old plant and plans call for at least 100 cabin biplanes to be produced at the new factory this year.

The Watkins Mooney, Swift and Sullivan companies expect to be in production shortly. Swift has four models completed and is awaiting government approved type certificates.

Arrow Starts Ground School

LINCOLN (NEB.)—The Arrow Aircraft & Motors Corporation started a school July 1 that will specialize in training men in the work of airplane building and includes classes in woodworking, assembling, etc.

Colonial Absorbs Rochester Firm

ROCHESTER (N. Y.)—Rochester Flying Service, Inc., has become affiliated with Colonial Flying Service, Inc., it has just been announced. The Rochester school is the third in the Colonial group. The other two are at Buffalo, N. Y., and at Utica, N. Y. William G. Dunlop, president of Rochester Flying Service, will remain in charge, the announcement says.

Form Company To Make Carbureters

MILWAUKEE, (WIS.)—Announcement has been made by W. E. Duersten of this city for the formation of the American Carburetion Company for the purpose of taking over the Carbureter Control Company, Los Angeles. The new company plans to operate plants in Milwaukee and Los Angeles for the purpose of manufacturing a carbureter for automobile and planes, developed by the Carbureter Control Company through H. W. Hess.

Four years have been spent in developing this carbureter and all tests have been completed and the marketing of the product is planned at an early date. Fred E. Keeler, president of the Lockheed Brake Company, is president of the Detroit Aviation Company and the largest individual stockholder of the Lockheed Brake Company, is president of the Carbureter Control Company and will be president of the American Carburetion Company.

Mr. Duersten will be vice president and general manager of the American Carburetion Company and Mr. Hess is chief engineer in charge of research and development and will also be a member of the board of directors. Plans are also under way to merge the American Carburetion Company with the Schofield Corporation of America. Mr. Keeler, Mr. Miller, Mr. Schofield and Mr. Duersten have been in conference in Milwaukee on a merger of several companies manufacturing automotive parts for both planes and automobiles and speed boats.

Test New Breese Aircraft Product

PORTLAND (ORE.)—The first plane to be produced by the new Portland factory of Breese Aircraft Company was given a thorough tryout over the Port of Portland Airport by Vance Breese, designer and head of the company, on June 24. The following day the plane was christened The City of Portland.

The plane is similar in construction to the Aloha which Martin Jensen flew from Oakland to Hawaii. It is a five-place cabin machine seating four passengers in the cabin and with the pilot's cockpit set high in the nose just behind the motor. It is powered with a Wright Whirlwind.

Two other planes are nearing completion in the factory.

Instruction Status Of Pilots Explained

NEW YORK (N. Y.)—Transport pilots seeking licenses as instructors must be in the employ of approved flying schools at the time of filing application for the instructors' licenses, it has just been announced by the Aeronautical Chamber of Commerce of America, Inc., at the request of the Aeronautics Branch, Department of Commerce.

"Transport pilots filing application for an instructor's license, either flying or ground work, will not be approved by the Department of Commerce unless they are actually employed by an approved flying school," the announcement says. "The Department of Commerce is now receiving a large number of requests from transport pilots for a flying instructor's license. The reason for this is either, first, the transport pilot wants to show his flying instructor's permit or, second, he thinks that such a license is necessary for individual instruction.

"The Department of Commerce wishes to announce that transport pilots' licenses are still good for individual instruction, that is, a transport pilot may instruct in flying individually as much as he desires, with full approval of the Department of Commerce and without restriction, but there will be no one man flying schools, and licensed flying instructors must actually be on the payroll of an approved flying school, otherwise they are wasting their time sending in applications."

Assemble Last J-5

PATERSON (N. J.)—The last of the Wright J-5 Whirlwinds to the manufactured passed through the assembly line of the Wright Aeronautical Corporation here June 29, the company reports. At the same time production started on the New Whirlwind Seven of the J-6 series, a seven cylinder radial which is said to develop slightly more power than the J-5 Whirlwind and to weigh slightly less. The J-5 enjoys the reputation of being one of the world's finest engines by virtue of the part it has played in a large number of trans-ocean and other outstanding flights as well as in the general field of aviation in this country and abroad.

Makes Women's Altitude Record

MOLINE (ILL.)—Mrs. Phoebe Omlie, of Memphis, Tenn., claimed a new altitude record for women June 29 when she reached 25,400 ft. in a flight under the auspices of the N.A.A. She took off at the local airport at 3:40 p.m. and landed at 5:50. Her plane was equipped with oxygen tanks.

Women in Aviation, Radio Subject

NEW YORK (N. Y.)—Radio broadcasting station WRNY this week began a series of radio talks on women in aviation. The first lecture was delivered by Frank M. Hawks.

Test Loening One-Wheel Float

ROOSEVELT FIELD (L. I.)—First tests of the new monowheel amphibion float, developed especially for use on light planes by Grover Loening Company, Inc., New York, N. Y., were successfully completed here late last week when B. Allison Gillies, test pilot for the concern, made a number of flights in a Cirrus Mark II powered, standard Moth biplane fitted with the new gear.

The amphibion device used in the tests was installed on a reconstructed Edo seaplane float. The single wheel moves up and down in a pocket running length-

Grover Loening inspecting float

wise along the keel forward of the step which is closed by two doors when the wheel is retracted, so that the bottom presents the smooth surface necessary for taking off and landing on water. A tail skid is mounted at the rear of the pontoon, which measures 17½ ft. in length and is 30 in. wide. Wing tip floats are used, of course, with long skids below to prevent damage in touching the ground.

Rubber disks form the shock absorbing unit for the wheel. The raising and lowering mechanism is of a new type, consisting of two toggle levers so hinged that when the wheel is out, the toggles are locked for carrying the load. Balance springs for the weights are used, and it is said that lowering or raising the wheel takes but one second. A lever in the pilot's cockpit is used for this purpose. The total weight added to the Moth by the substitution of the seaplane floats and amphibion gear for the usual landing gear is but 80 lb., according to officials of the Loening firm.

Contradictory to the general belief, there was very little tendency on the part of the plane equipped with the single wheel amphibion gear to ground loop. In the tests, the Moth swung about 10 deg. out of the wind when coming to a stop.

P.A.A. Adds Three Fokkers

HASBROUCK HEIGHTS (N. J.)—Three tri-engined Fokker transport monoplanes have been completed at the plant of Fokker Aircraft Corporation of America and will be ferried in the near future from Teterboro Airport to Miami, Fla., where they will be placed in service on the lines of Pan-American Airways, Inc.

Parks Planning Three Plane Types

ST. LOUIS (MO.)—Plans for the production of three types of monoplanes selling from $3,500 to $15,000 by the Parks Aircraft Company are called for in a $2,500,000 airplane and automobile expansion program of the Gardner Motor Company, this city, controlling an 80 per cent interest in the former concern. It is understood the new planes will be powered with Lycoming engines, as are used in Gardner automobiles.

The program will require the issue of 200,000 shares of additional Gardner stock, which move is expected to be approved by stockholders at a meeting August 1. The stock at present is selling at about $14. Further details of the expansion, as affecting aircraft, are not yet availabale.

International Race For Balloons Discussed

ST. LOUIS (MO.)—Eighty men, including many business and civic leaders, met at Hotel Statler here recently to discuss plans for the Gordon Bennett International Balloon Race which will start from St. Louis September 28. Felix Gunter, vice chairman of the First National Bank, is head of a Finance Committee named to raise $30,000 with which to finance the event. The tentative budget includes $3,000 in cash awards and $6,500 for bonuses and expenses of contestants.

Twelve entries, including representatives of Argentina and Belgium are expected. There are three United States entrants thus far: Capt. William Kepner, Lieut. T. G. Settle, U.S.N., and Ward Van Orman.

This will be the second time that St. Louis has been the starting point for the international race. The first event, in 1907, was witnessed by 300,000 persons.

Movies to Use Curtiss Service

NEW YORK (N. Y.)—First National Pictures, Inc., and the Curtiss Flying Service, with its branches in about 40 cities throughout the country, have entered into an agreement whereby the latter will be at the service of the former within an hour's notice at all times. The plan is to speed up the transport of pictures, movie salesmen and stars between strategic points and in other ways to eliminate delays which other forms of travel would involve.

American Eagle Opens New Factory Branches

KANSAS CITY (KAN.)—Inaugurating its new distribution plan of establishing factory branches at strategic points throughout the country, American Eagle Aircraft Corporation has shipped four American Eagle biplanes to Harry E. Trotter, district sales manager of the newly created branch at the Grand Central Air Terminal, Glendale, Calif., according to E. E. Porterfield, president of the local airplane manufacturing concern.

Besides the Los Angeles branch, the American Eagle company will establish branches at New York, N. Y.; Chicago, Ill.; Minneapolis, Minn.; Atlanta, Ga.; Dallas, Tex., and Portland, Ore. A complete stock of airplane and engine parts will be maintained at each of these branches, in addition to a number of complete planes. The personnel at each will include a demonstration pilot, a service man and a clerk.

"Our new factory branch policy will enable us to be within a few hours' flying time of anyone seeking a demonstration of one of our planes, or in need of aeronautical service. We have been trying out the system for the last four months and in only one case, have we failed to sell a plane where it was flown out for demonstration. There is a very essential contact which can be made through the personal demonstration only. We feel that this new policy will increase our sales very materially this year."

Form Voting Trust For T. A. T. System

NEW YORK (N. Y.)—Stockholders of Transcontinental Air Transport, Inc., have received a letter from C. M. Keys, president of the airline operating company, announcing the preparation of a voting trust agreement for the stock of the concern in order to insure a continuation of policy in the management of the company, it has been learned. The agreement, dating from June 10, 1929, is to remain in effect for 10 yr.

Mr. Keys' letter is said to call the attention of the stockholders to the fact that the firms holding the largest interests in the company, which include The Pennsylvania Railroad Company, National Aviation Corporation and North American Aviation, Inc., plan to exchange their stock for voting trust certificates. Applications will be filed, it is understood, to list the voting trust certificates on the San Francisco Stock Exchange and the New York Curb Exchange.

Voting trustees of T. A. T. include Mr. Keys, J. Cheever Cowdin, Richard F. Hoyt, J. L. Maddux, Paul Henderson, Henry Breckinridge and D. M. Sheaffer, while the Bankers' Trust Company, New York, and the Anglo-London-Paris National Bank of San Francisco are the depositaries under the voting trust, it was learned.

Helium Companies Combined in Merger

LOUISVILLE (KY)—The Kentucky Hydrogen and Oxygen Company and the Helium Company of Louisville the only producers in commercial quantities of helium gas in the country have been merged with a $5,000,000 holding and operating company which will be known as the Girdler Corporation A large plant which will house all the manufacturing processes of the corporation will be built here. Helium plants will be located in Kansas Colorado and other western states

R. W. Bottoms, chief research chemist of the company, who prepared the fuel gas for the return of the Graf Zeppelin on its visit to the United States, is redoubling the activity of the research staff to meet the demand for the non-inflammable, non-explosive gas for airships Besides supplying the Navy with the gas the company furnishes it to commercial operators

Walter H Girdler is president of the new corporation Other subsidiaries are Tube Turns, Inc, Vogt Processes, Inc, Vogt Instant Freezer Corporation and the Cerry Burell Vogt Company. E. G Luening and C. M. Vogt are the vice-presidents and E S Graff, secretary and treasurer

Plan Big Flying Center at Dayton

DAYTON (OHIO)—Seeking to reclaim its early glory as an aviation center, which it has allowed to slip from its grasp with the recent rise in commercial activities Dayton, Ohio will by January 1 establish an elaborate aviation school

Such is the announcement of Frederick Beck Patterson, president of the National Cash Register Company who has just returned to the States after inspecting all the principal airports and schools of Europe

The proposed air school will be located at the Dayton Airport at Vandalia, Ohio Class rooms lecture rooms laboratories and dormitories to accommodate 100 resident students will be erected immediately it was said Approximately $500 000 will be spent on the air college

Interested with Mr Patterson in the project are Orville Wright, and John A. Macready, former Army Air Corps pilot.

Prepares for Berlin Hop

CHICAGO (ILL)—The Sikorsky amphibion, "Untin Bowler" which is scheduled to take-off Wednesday, July 3 on a round trip flight from Chicago to Berlin by way of Greenland under the sponsorship of *The Chicago Tribune* arrived at the Municipal Airport here early this week in one of the worst electrical storms of the season The plane has been in the East for the last month, where equipment necessary for the Berlin flight was fitted

Ex-Cell-O Changes Name

DETROIT (MICH)—Ex-Cell-O Tool and Manufacturing Company, this city, has announced the change of its name to Excello Aircraft and Tool Corporation, as a result of the tremendous increase in the aviation parts business done by the concern A program of expansion, which will include the addition of a number of new parts to its catalog, the stepping up of production on its regular line and the building of a new factory is announced also.

Curtiss-Wright Firm Announced

(Continued from page 45)

There will be no public financing of the new concern for the present, according to Mr Keys, the merger itself having served to provide what additional financing considered necessary for the immediate present This additional financing was said to have been required by the expansion of the Curtiss Buffalo plant

It is considered probable that manufacturing of planes and engines will be consolidated for more efficient production Sales and service in this country and abroad, is expected to meet with extensive economies through the concentrated agencies of the Curtiss Flying Service and the Curtiss Exports Corporation respectively

Each to Handle Others Products

Curtiss agencies and Wright agencies will handle each others products, Mr Keys said and consolidations of existing agencies will be made where necessary in the interests of the companies As both Wright and Curtiss are still in the development stage of their agents, the new plan is considered timely and not likely to upset present arrangements to any appreciable extent

Mr Keys expressed doubt about early realization of adequate returns from any of the country's passenger air transportation systems He expects that it will be some time before they begin to pay and that a great deal of experimenting must be done under actual operating conditions first.

The transport companies are, in the meantime, attractive customers for the engine and plane builder He asserted that purchases of Curtiss-Wright products by the transport companies associated indirectly with the new enterprise is not precluded under the new plan and cited the fact that T A T N.A.T. and P.A.A have bought widely outside these allied companies

The reason given for not including transport systems under the terms of the merger was that the problems of air transportation and aeronautical manufacturing differ by wide margins and it is considered wisest for the present to keep their activities as distinct as possible

Commenting on reports that the Curtiss company is building several 18-passenger transports of the Condor type for

Curtis Publishing Company Plans Survey

PHILADELPHIA (PA)—Curtis Publishing Company, publisher of *The Saturday Evening Post* and other periodicals, has purchased a Ford-Stout all-metal monoplane to be used as a flying laboratory in conducting a nationwide investigation of the trends of the aircraft industry and also a study of the advantages to be gained by business organizations in employing aircraft, according to an announcement by George H. Lorimer, first vice-president of the publishing house

The plane is being fitted with office equipment including a desk, typewriter, filing cabinets and other fixtures that will be required by C. C. Parlin, head of the division of commercial research for the Curtis publications, and his staff who will conduct the investigation of the aeronautic industry Mr. Parlin is the one who conducted the study of the automobile industry in 1913. The home port of the plane will be the Central Airport, Camden, N. J., just across the Delaware River from Philadelphia Aside from its use by Mr Parlin and his staff the plane is to be used to transport officials of the publishing company from place to place when necessary.

Announce Curtiss School Prices

NEW YORK (N Y)—Curtiss Flying Service, Inc, 25-27 West 57th Street, has announced that the prices for the flight training offered at the various schools operated by the company throughout country will be $600 for the private pilot's course, $1 300 for the commercial pilot's $4,500 for the course given those seeking transport pilot's licenses, and $1,000 for the seaplane course. These prices are standard

T.A.T. Mr. Keys said that these machines are contracted for by the Curtiss Flying Service, which is the company's chief selling agent "We are inclined to think that an 18-passenger plane, with about the same cost and performance as smaller ones and with the same horsepower, will create a fair demand," he said

A firm belief in the future of both air cooled and water cooled engine types with emphasis on the Prestone possibilities in the latter was expressed Water cooled will have their biggest field in his opinion in the demand for engines so large in horsepower that the radial cannot do the job without being so large as to be hopeless

There is room for both, he said and development of both to the extent of their possibilities will be one of the main objects of the Curtiss-Wright program.

He admitted that the aviation industry as a whole has slowed down a little but that this backing up was chiefly in a few types of engines or planes.

PERSONNEL

DAVID C WIKOFF and MILTON C BAUMAN have been appointed general manager and chief engineer respectively, of Butler Aircraft Corporation, Kansas City

W. C VAIL, formerly of Cessna Aircraft Company, has been appointed field sales supervisor of the Swallow Airplane Company, Wichita

CAPT AUBREY KIEF has been appointed traffic manager and director of public relations of Curtiss Flying Service, Denver Colo

MAJ A H S MARTIN, Wright Field, has resigned to become identified with The Aviation Corporation, New York City

MAJ BRADLEY JONES, Wright Field, has been appointed professor of aeronautics in the School of Aeronautics and Commerce, University of Cincinnati

WILLIAM M. MCCONNELL has been appointed pilot for the Firestone Tire & Rubber Company

W J. RUOF has been elected treasurer, and ROBERT GUINTHER, secretary of Middle States Air Lines, Inc, Akron, Ohio

PROF HILDING CARLSON Boston University, has been appointed chief of the ground school operated by Skyways at Marstons Mills, Cape Cod

BYRON HATCH has been appointed test pilot for Mono Aircraft, Inc, Moline, Ill

MILFORD SATER has been appointed chief instructor at the Universal flying school at St Louis

A W MAXWELL has been elected president of Maximum Safety Airplane Company of Los Angeles

V I POWERS has been added to the Braniff Division, Universal Air Lines, as pilot.

J C DOCKERY, formerly with Universal Air Lines, has been named flying instructor for the Garland Clevenger school of aeronautics, Tulsa, Okla

CAPT RUSSELL YOUNG has been appointed commander of the Thirty-Fifth Division Air Service and test pilot for Mahoney-Ryan Aircraft Corporation, St Louis.

FREDERICK K. TEICHMANN, instructor in the Daniel Guggenheim School of Aeronautics New York University has sailed to take up a summer appointment with the Junkers company in Germany

POWELL HUNTER has been appointed radio operator with the American International Airways, Inc

OLIVER ROSTO has been appointed supervisor of factory inspectors Aeronautics Branch

JAMES H. KELLY, co-pilot and mechanic of the "Fort Worth" has become affiliated with the Texas Air Transport Flying School, Fort Worth

CAPT WILLIAM F LADD Hartford Conn is in charge of the air program for the Governors' Conference to be held in New London, Conn, July 16, 17 and 18

JOHN SCHLEGEL, of the Fairchild Aviation Corporation, has been appointed chairman of the Export Committee Aeronautical Chamber of Commerce

HAROLD L. DEBUS has been promoted to the publicity department of Western Air Express, at Los Angeles

JACK ATKINSON has been transferred to the Oklahoma City division of Universal as vice president in charge of operations

PRESTON SNEED has been appointed director of municipal airports, Dallas, Tex

HARRY A HAMMILL has been appointed district sales manager for the American Eagle Aircraft Corporation, for Ohio and other central western states

MAJ CHARLES H WOOLLEY has been elected chairman of the aviation committee, Boston Chamber of Commerce

D. J. COLYER has been appointed vice-president of Fleetwing Aircraft, Inc, Lincoln Neb

H L GIBSON has been appointed advertising manager of the replacements department of the Russell Manufacturing Company, Cleveland

Anglo-American Firm Reported

NEW YORK (N Y)—Reports here state that the organization of what will be called the Anglo-American Aviation Company is nearing completion This concern according to reports, would be a holding company interested in a number of American firms, not named and in such English concerns as Rolls-Royce, Avro Cirrus and Handley-Page. A strong interest in the latter concern is said to be particularly desirable on account of the slot devices which the company has developed It is expected official announcements may be made soon

AERONAUTICAL CALENDAR

July 16-27	International Aircraft Exhibition of the Society of British Aircraft Constructors Olympia London.
Aug 24-Sept 2	National Air Races and Aeronautical Show Cleveland Ohio
Aug. 26-28	Society of Automotive Engineers Cleveland Aeronautic Meeting
Sept. 2-7	Class C Aviation Exhibit Rochester Exposition at Rochester N Y
Sept 6-7	Schneider Cup Race over the Solent Cowes England
Sept. 23-28	Fourth Annual New England Aviation Exposition, Boston Garden, Boston Mass.
Sept. 28	Gordon Bennett Balloon Trophy Race St. Louis Mo
Oct. 5-21	National Air Tour starting from Ford Airport, Dearborn, Mich
Oct. 12-27	Southwestern Aircraft Exposition State Fair Grounds Dallas, Tex
Nov 18	Lehigh Airport Design Competition closes Lehigh Portland Cement Company
Dec 1-9	International Aeronautical Exposition of the Aeronautical Chamber of Commerce, Chicago

TRADE TIPS

It has been reported that

Pompano, Fla, is in the market for a 24-in. revolving beacon.

An open competitive examination will be held by the Municipal Civil Service Commission, Buffalo, N Y, on July 22 for the position of superintendent of operations at Buffalo Airport Salary will be $2 580 to $2,760 per year. Applications must be filed by July 15

Birmingham Ala, has selected a site for a new municipal airport and financing will be started at once

The concern of Toepka & Company, Guatamala City, Guatamala is interested in representing American aircraft manufacturers in that area

Additional improvements are planned at the recently completed Bradford, Pa., airport Plans now under preparation provide for the construction of another runway 3,500 ft. in length, and the erection of pilots' quarters

Y E. Howell, clerk of the Coahoma County Board of Supervisors Friars Point Miss, is taking bids on construction of hangar at the flying field just east of Clarksdale, Miss

The city manager of Long Beach, Calif, will soon let the contract for construction of hangar and office quarters at the Long Beach Municipal Airport The estimated cost is $35 000

The city engineering forces are completing plans for the hard surfacing of the Tampa, Fla Municipal Airport.

Representatives Named

CHADBOURNE DONZE — G L Slaybaugh Ventura Airport Montalvo, Calif

NEW STANDARD—Newport Air Transport, Inc Newport R I for the state of Rhode Island and the Cape Cod section of Massachusetts

GREAT LAKES—North Atlantic Aviation Company Exeter, N. H, for New England

R W SAFETY BELT—Universal Aviation Corporation, Lambert-St. Louis Field, Mo

DAVIS — Washington Aircraft & Transportation Corporation Seattle, for the Northwest, including Washington Oregon, Idaho and Alaska

BAELINO—Toepka & Company, Guatemala City, Guatemala

PYLE-NATIONAL—Super Service Corporation and Research Club, Inc

CURTISS FLYING SERVICE—Jefferson Airways Inc, Jefferson City, Mo and Wright Flying School St Elmo, Ill.

Ask for Help on Races

CLEVLAND (OHIO)—A call for 300 volunteers to assist in handling the technical details of the National Air Races has been issued by Floyd J Logan, race chairman Questionnaires, outlining the various posts to be filled, were sent to members of the Cleveland chapter of the N A.A., which is sponsoring the event.

BRIEFLY

Ohio Seamless Tube Co, Shelby, Ohio, has approved plans to increase plant capacity 40 per cent.

Monterey Calif., Flying Club has been organized

The Denver-Kansas City air passenger service of the United States Airways, Inc, is now located at the new Curtiss Field, Denver, Colo

St Louis Aviation Corporation is to open offices soon in the Security Building, St Louis.

H. H McNally, assistant general traffic manager of the Universal Aviation Corporation, has gone to Los Angeles, to organize a division traffic office at that terminal of the transcontinental air-rail route.

During the first two weeks of June the Braniff Airlines carried more than 500 passengers on their southwestern airlines

Braniff Airlines have started work on their new $90,000 hangar at the Tulsa Municipal Airport.

The first of a string of branch aviation schools to be operated by the Pioneer Aviation Company, Omaha, has been started at Hoisington, Kan.

Officers elected by the Nebraska Sailplane and Glider club are H M Gregory, president W M Bastien, vice-president, Roger Norsikian, secretary, A. Moe treasurer Fred Armonett, master mechanic.

Pratt & Whitney Aircraft reports more than $9,000,000 of orders on hand and approximate engine construction for June, 200

Inland Aviation Company, Kansas City, is reported to have sold its first plane and to be planning erection of a factory

Silverton, Ore, will hold its annual American Legion air carnival July 6 and 7.

A new catalog has been issued by the South Bend (Ind.) Lathe Works.

Lloyd-Mosier Air Commerce, Inc, Colorado Springs, Colo, will open regular plane sightseeing service over Pike's Peak this summer.

New Standard Aircraft Corporation is said to be planning an all metal twin-engined transport monoplane this fall.

Six Boeing 95 cargo planes and four Curtiss Falcon mail planes have been delivered to N A T for use on the Chicago-New York and Chicago-Dallas lines, respectively.

Manufacturing firms at Lambert-St Louis Field now have a total of 560 employees.

Ideco Beacon Towers are being shipped to San Juan, Porto Rico, for Pan American Airways lighting.

The General Alloys Company Boston, plans to equip its sales force with planes.

Litchfield Trophy was presented June 25 to Lieut T G W Settle, and Ensign Wilfred Bushnell winners of the National Elimination Balloon Race

The 36-foot dome of the Williamsburgh Savings Bank of Brooklyn, N Y., built up of horizontal metal louvers has been floodlighted internally.

Jasper A Gilham, Brooks Field, is said to have invented a detachable trap door flooring for releasing passengers from disabled planes

Richard W Mackie Colonial Air Transport, made 631 consecutive loops June 24 over Boston in a Fleet

The New York State Aviation Commission is considering measures to eliminate undesirable aviation schools.

Bert Hassell and L H Fredericks will attempt a Rockford Greenland flight in August.

Construction of the first of the Armstrong seadromes is to be started at once.

Plane-ground London telephone conversation was achieved by the Western Electric Company over Hadley Field, N J, recently

Gipsy Moth production is four machines a week, one a day is expected to be realized in July.

New Firms Announced

AMPHIBIAN AIRCRAFT CORPORATION, Los Angeles, Calif, capital, $1,500,000, by Louis F Vremsak S Leroy Putnam, O B Kerr, Stuart L Klingelsmith, Paul Whittier, Leo LaCasse, and T C Heyl, to manufacture aircraft.

WHITE MOUNTAIN AIRPORT CORPORATION, at Conway, N H to develop and operate an airport at Conway and at Manchester, N H.

MAINE SEAPLANE TERMINALS, INC., Portland, Me.

CRYMBLE AIRCRAFT CORPORATION, Bangor, Me

BUFFALO FLYING CLUB Buffalo, N Y ; capital $4,000, by Robert W Lewis, Grant Quale, and Otto Stanton to develop interest in individual aviation.

BINGHAMTON FLYING SERVICE, INC, Binghamton N Y, capital $100,000 by W F Van Cleve and associates, to establish and operate a commercial flying service in the township of Chenango.

MALONE AERO CLUB, Malone, N Y ; capital, $10,000 by J F Badger, 2d, and associates, to promote local interest in aviation and establish a commercial service

LAPORTE AIRWAYS, LaPorte Ind by R Paul Bowman and John B Condra, to develop an airport and provide flying school and commercial service.

FAIRCHILD SHARES CORPORATION, 122 East 42d St, New York City, capital, 1,000 shares non par value stock; by Sherman M Fairchild Graham B Grosvenor, George B Haan, William J Cullen Clarence E Bahn and Howard F. Mulholland, to deal in aviation securities

AMERICAN CANADIAN AIR LINES, INC, of Boston, Montreal, and Halifax, N. S ; capital, $100,000 ; T. H. Coughlin, Minnie Liberman and William H. Wardwell to conduct a business of manufacturing, repairing, and otherwise dealing in motor-driven vehicles and to act as a common carrier, transporting passengers and freight."

SOUTHWESTERN AERIAL SURVEYS, INC, 108 E 10th St, Austin, Tex, by John D Miller and others

MID-SOUTH AIRCRAFT CORPORATION, 4 West Norwood St., Memphis, Tenn ; $100,000; by Ira Allstad, Jr, and others

AIR SERVICE CLUB OF CALIFORNIA, Los Angeles, Calif, by Dudley M Steele, C C Spicer, Victor N Clark T M Morgan, W P Baldersten, and others

EVOL AVIATION COMPANY, St. Louis, Mo, capital $25,000; by H H Knight H M Bixby and Royal L Coburn to manufacture own operate and control airplanes, airports and air routes deal in aviation securities, etc.

MID AMERICA FLYING SERVICE, INC, St Joseph Mo capital $2,000, by Harry Block, William L Goetz and Melvin E Binswanger to operate an aviation school, transport passengers and freight by airplane, etc.

NU-SUN BUS AIR LINES, INC., Kansas City, Mo capital 250 shares no par value common stock and $2,500 in preferred stock by W. A. Nissen, C. C. Madison and Stuart L Nissen, to transport passengers and freight by bus or aircraft.

CHAGNARD INTERNATIONAL AVIATION CORPORATION, 135 West 122d St, New York City capital 1,000 shares no par value stock by Edmund Chagnard Dorothy Daner and Gustave A Rogers, to deal in aircraft

AVIATION CONSOLIDATED HOLDING CORPORATION, 15 Broad Street, New York City capital 600 shares no par value stock by Murray D. Welch, Russell E Sumner and William S. Savage to own realty for aviation purposes.

TWENTIETH CENTURY AIRCRAFT CORPORATION, Syracuse N Y ; capital 5,000 shares no par value stock by Arthur C Mead, John P Todd and Ramford C Marscher, to manufacture aircraft.

ALLIED AVIATION EQUIPMENT CORPORATION, 305 East 47th St., New York City, capital 1 000 000 shares no par value stock to deal in aircraft and equipment.

SOUTHERN AVIATION ENTERPRISES, INC, Atlanta, Ga, by R. E. L. Cone, Carl Hutcheson Byron Saunders and Mrs C T Cone; to build a factory and develop a system of holdings throughout the South

EDO SEAPLANE SERVICE, INC, College Point, L. I., capital 200 shares no par value stock, by Earl D. Osborn, George B Post, K D Vosler; to carry out experimental work with Edo pontoons

AIRPORTS AND AIRWAYS

Air-Rail System Links Texas and Mexico

DALLAS (TEX)—Another time-saving travel arrangement, which makes possible 29-hr. service between Dallas and Mexico City, has been announced W. L. Morrison, of Mexico City, and Jack McDermott, of San Antonio, representatives of the Compania Mexicana De Aviacion, have completed negotiations with representatives of Southwest Air Fast Express and other air passenger lines, relative to further speeding up of the passenger travel

Under the present arrangement passengers may leave Dallas at 8:30 a.m. by air for San Antonio, arriving there at 11 30 a.m. From San Antonio, to Brownsville the trip is made by train, with arrival on the following morning At Brownsville the fourteen-passenger planes start for Mexico City at 8 15 with arrival at Mexico City at 1 45 p.m. By an agreement with the S A F E, the Mexico City passengers can reach Chicago in 35 hr, proceeding to Dallas by air and rail, and taking S A F E planes from Dallas

Build Cantilever Hangars

PHOENIX (ARIZ)—A cantilever type hangar with a clear door opening of 110 ft. at rear and back without any obstructions over the entire floor area has been completed here by The Austin Company for Scenic Airways, Inc., a United Aviation Corporation subsidiary. The hangar is 120 ft. long. The building cost $40,000. A similar hangar has been erected for the same company at El Paso. Construction consists of two main carrying trusses with supporting cantilever trusses. The clearance under the trusses is 20 ft. Fenestra tubular steel sliding doors of the round-the-corner type are provided. The door opening may be extended to 300 ft, without obstructions, later, it is said.

Southern Installing Radio

FT WORTH (TEXAS)—Southern Air Transport is installing a two-way radio telephone and telegraph system along all of its passenger lines, it has just been announced. The system will be operated on a low wave length, below the 100 meter band, and will permit pilots of different planes as far away as El Paso and Atlanta to communicate with each other while in the air and also with ground stations, it is said.

Starts 24-Hr. Weather Service

ST. PAUL (MINN.)—The local Municipal Airport has established 24-hr meteorological service, starting July 1, F. J. Geng, airport manager, has announced.

Start Youngstown-Cleveland Line

CLEVELAND (OHIO)—Daily air passenger service between Youngstown and Cleveland was started July 1 by Bernard Air Lines, Inc., of Youngstown. Connections are made at Cleveland with the morning and evening planes of the Cleveland-Detroit trans-lake passenger line. Stinson-Detroiter cabin monoplanes carrying five passengers are used. Ralph S. Thomas is chief pilot. The trip is made in 50 min.

To Air-Mark Ohio For National Races

CLEVELAND (OHIO)—Clifford W. Henderson, manager of the National Air Races has started a drive to have every community in the state air-marked with arrows pointing to Cleveland before the races start.

In a letter to George B. Chandler, Columbus, secretary of the Ohio Chamber of Commerce, Henderson requested co-operation of that group to mark various cities.

Two kinds of markers are specified. One is to be a permanent sign with the name of the city and an arrow pointing north. The other is a temporary marker pointing toward Cleveland and bearing the message, "Welcome to the Cleveland Air Races."

N.A.T. Extends Day Service

CHICAGO (ILL.)—Service on the day air mail and express line operated by National Air Transport Inc., from Chicago to Kansas City was extended early this week through Tulsa and Ft Worth to Dallas, Tex., a distance of 504 mi. This extension of the line doubles the air mail service to the Texas cities, which are already served by the N A T night line from Kansas City through Wichita and Ponca City to Oklahoma City. It also brings the mileage flown by N.A.T. planes in every 24-hr period up to 7,500. Four new Curtiss "Falcons," powered with 400 hp Liberty engines, have been added to the National Air Transport fleet on the southern route for service on the new day run.

New Orleans-Cuba Line Studied

NEW ORLEANS (LA.)—Plans for air passenger service between this city and Cuba, although still in the preliminary stage, have received serious consideration and will in all probability be carried out, according to James R. Wedell, president of the Wedell-Williams Air Service. The company has already purchased one Keystone-Loening amphibion and is planning to build up a fleet for the service. There is also a possibility of an air mail contract.

Washington Air Terminals Buys Line

WASHINGTON (D C)—Purchase by The Washington Air Terminals Corporation of all the properties and assets of the United States Air Transport, Inc, operator of the Washington-New York airline and Washington Airport, which is just across the Potomac River in Virginia, was announced here late last week. The Washington Terminals company, a new concern, is said to be under the control of Federal Aviation Corporation, which maintains its headquarters at 122 East 42d St, New York, N. Y.

Operation of the airline, which uses the Newark Metropolitan Airport, Newark, N. J., as its northern terminal and the Washington Airport as its southern base of operations, will be continued by Washington Flying Service. Steps to improve the service rendered by the airline will be taken immediately, according to the announcement, by placing a fleet of Pratt & Whitney "Wasp" Series "C" powered, Lockheed "Vega" monoplanes in operation. The Washington Flying Service, which also operates a taxi and sightseeing service, holds a sales agency for Ryan, Waco and Lockheed craft.

The Washington Airport, likewise, will be improved. No mail or express will be handled there, but an attempt to make it one of the finest air passenger terminals with every facility for the comfort and convenience of the air travelers utilizing it, is to be made. Arlington Beach, which has long been a summer recreation resort, has been purchased by the air terminal company and will become a part of the airport it is said.

The Washington Air Terminals Corporation has also obtained control of the Thousand-Acre Airport, located two miles south of Alexandria, Va., and the company plans to push the development there of one of the most completely equipped aviation schools in the country.

Among the directors of the new firm are C. Bascom Slemp, former secretary to President Coolidge, M. C. Cooper, vice-president of Federal Aviation Corporation; James O. Watson, Hambleton & Company, Maj. Gen. William M. Wright, U. S. A. (Ret.), and David K. E. Bruce, Harriman & Company; Howard Sutherland, Alien Property Custodian and former U. S. senator from Virginia, is the president. Col. C. E. Fauntleroy is the president of Federal Aviation Corporation.

Put Amplifiers on Stations

ST. LOUIS (MO)—Three powerful speech amplifiers are being installed on the exterior of Universal's passenger station at Lambert-St. Louis Field.

Report Additional Airport Construction

Development Work Continues in Many Places

Additional land is to be taken over for the East Boston airport. All hangar space is taken and a large waiting list is ready for more hangars when they are built. The Embry-Riddle Company Cincinnati has secured permission to erect a $90 000 hangar at Lunken Airport. The building will be 300 x 175 ft of brick, stone and steel construction.

A time warrant issue of $120 000 has been provided for the construction of a seaplane base at Burgoyne Island near Daytona Beach, Fla. R. J. Blackburn, St Louis, has a contract for laying drain pipes at the Lambert-St Louis Field. He was second lowest bidder with an offer of $104,516.

The Graybar Electric Company has been awarded a contract for $15 000 lighting equipment at Fairfax Airport Kansas City. Interior decorators are now at work on the Oakland Municipal Airport Inn to be opened early this month under the management of the Interstate Company. The Inn contains 37 rooms and adjoins the airport restaurant which can accommodate 185 dinners simultaneously. A. E. Brown is the manager.

New Long Island Field

The Ellensburg Airport Company Ellensburg, Wash. is improving the runways and Felts Field, Spokane Wash., is being improved by grading and installation of boundary lights. Advanced Aircraft Corporation former owners of the new Curtiss Field at Valley Stream, L. I., has acquired 250 acres at Rockaway Boulevard on Jamaica Bay, L. I. for land as seaplane port development.

A $10,000 hangar is to be constructed at the Concord, N. H., airport and a new hangar has been completed at Burlington, Vt. Bar Harbor, Me., plans an airport. Work has been started on the construction of the Cowing-Shearman airport at Jamestown, N. Y. Beacons and other lighting facilities, housing facilities hangars, rest rooms, etc., are to be installed.

Omaha Work Starts

Work of leveling the runway at the Omaha, Neb., municipal airport has started under the direction of The Austin Company of Cleveland. Bids on the lighting equipment were to be opened July 2 and the drainage bids are being studied.

Contract for the construction of hangar No 5 for the Los Angeles Metropolitan Airport has been let to George A. Chapman of Van Nuys, Calif. and work is started. This hangar will house the planes and equipment of the Caddo Motion Picture Production Company.

Electric Power & Equipment Company, Columbus, Ohio, will install the lighting and power lines at the new Columbus hangar of T A T. The International Derrick & Equipment Company, Columbus, will build a four-plane hangar for the municipal airport at Marion, Ohio.

A $500,000 improvement of Meacham Field and purchase of additional land adjoining it was included in a $3,000,000 bond issue voted at Fort Worth, Tex., June 26. New equipment includes $30 000 hangar and a $60,000 administration building and concrete aprons. The new land includes about 170 acres. Tampa, Fla. is planning a combined land and seaplane base of considerable size. Bowles Field at Springfield, Mass., is being developed rapidly.

Navy Expands Airship Base Hunt

PORTLAND (ORE.)—Continued protest by northwestern Chambers of Commerce against the announced intention of the Navy Department to locate the proposed western dirigible base in southern California has born fruit, according to notification received from Senator Steiwer of Oregon by the local chamber and the Aero club of Oregon. The Pacific Northwest will be considered as well as California in the race to provide the site Senator Steiwer said.

Government land in the Columbia River near Portland, Tongue Point near Astoria, Medford, Bend, and Orenco have been cited as possible places for the field.

P.A.T. to Speed Up Service

PORTLAND (ORE.)—Installation of new Hornets on Pacific Air Transport planes in the place of the Wasps now used will allow the coast schedule for mail and passengers to be speeded up 1 hr. 45 min northbound and 1 hr 15 min southbound on July 15, officials have announced. Under the new schedule mail planes will leave Los Angeles at 11 45 p.m. arriving at Seattle at 7 p.m. Planes with mail and passengers will leave Portland at 7 a.m. arriving at Oakland at 12 45 p.m. and at Los Angeles at 5 p m.

Airports to be Dedicated

Among the airports scheduled for this season are the following, according to latest reports:

July 4 5 and 6 Thetford, Vt.
July 4 Bridgeport, Conn
July 4-7 8 Port Columbus, Columbus Ohio
July [illegible] Pueblo Colo Municipal Airport
July 13 14 Grand Island Neb Municipal Airport
July 20 Williamsport, Pa.
July 20-21 Hensley Field Dallas, Tex.
August 23-24 Big Spring Tex.
September 2 Curtiss-Steinberg Field St. Louis, Mo

Aviation on Country Club Field Opened

The first unit in the proposed chain of Aviation Country Clubs, Inc., which has headquarters in New York City, was dedicated June 29 at Hicksville, L. I. This unit is known as the Long Island Aviation Club includes an 80-acre landing field, a large hangar, a club house and other facilities and is located about five miles east of Roosevelt Field. The present plant has cost about $300,000. Prominent individuals in government and civic aviation were present. More than 100 planes were flown to the event.

The Memphis, Tenn, Municipal Airport was dedicated June 14, 15 with a program which attracted more than 50 000 persons and about 150 planes. Races and various stunting exhibitions were staged.

Wichita's new mile square airport was opened recently with a program that was marred somewhat by a downpour of rain. The airport is now in full operation. The DeKalb County Airport has been dedicated with ceremonies in which nine government planes participated. Among the others recently dedicated are the Bremerton, Wash. airport, the Lander Wyo airport and the Erie County airport near Erie, Pa.

Mid-Continent Plans New Route by July 25

WICHITA (KAN.)—By July 25 Mid Continent Air Express expects to be in operation over the Kansas City-Denver route. Phillip A Philbin general manager of Mid-Continent, which is a subsidiary of Western Air Express, has completed his survey of the route.

Although Western Air Express has not selected cities to be served, the following are being considered: Topeka, Emporia, Wichita Hutchinson, Dodge City Garden City and Syracuse in Kansas, and Lamar LaJunta Pueblo, Colorado Springs and Denver in Colorado.

Single-engined Fokkers will be used at first with tri-engined Fokkers to be added if business justifies. Considerable summer tourist travel to the mountains in Colorado is anticipated.

Air Meets

Among recent air meets was one held June 30 at Roosevelt Field, L. I., in which R. L. Brooks won the race for planes with motors of 255 hp. Lieut. James H Doolittle and Capt. Frank M Hawks participated.

An air meet being held July 4 to 7 at the Mount Tom airport, Northampton, Mass., is sponsored by the American Legion. The Bloomington Flying Club, Bloomington Ill., will sponsor an air show and Derby on July 11. More than 500 pilots have been invited to the air Derby to be held at Eugene, Ore., July 25-27. The National meet of the Sports Flyers will be held at Denver, August 10-11

Universal Changes Airline Schedules

ST LOUIS (MO.)—Lines operated in and out of St Louis by the Universal Aviation Corporation covered 217,805 mi during the first five months in 1929 and carried more than 1,100 passengers, according to headquarters here. The St Louis-Chicago division carried the most passengers, 755.

Two time-table changes are announced to link up with Universal's new transcontinental air-rail service. The "Skyline Limited" now leaves St Louis at 12 45 p.m., arriving at Chicago at 3 15 p.m. It previously left here at 1 25 p m. The southbound plane leaves Chicago at 1 p m arriving at St Louis at 3 40 p m.

S.A.F.E. Cuts Flying Time

DALLAS (TEX.)—Effective Monday July 1, an hour will be clipped off the flying schedule of S A F E service between Dallas and Kansas City, Frank Phares, southern manager of the Southwest Air Fast Express announced. The present schedule of departure at 8 30 a m will be continued, however, the plane will reach Kansas City at 2 30 p m. instead of 3:30.

Report N. Y.-Miami Express

JACKSONVILLE (FLA.)—Elliot W Butts, manager of the local chamber of commerce announces that Eastern Air Express Corporation, of New York, has informed the chamber recently, through G P. Morriss, executive vice president of the operating company, that it would inaugurate shortly a direct air express line between New York and Miami by way of Jacksonville. The chamber secretary has been asked to assist the corporation in securing the necessary terminal facilities.

Cincinnati Men Form Mason & Dixon Air Line

CINCINNATI (OHIO)—A new air service from Cincinnati to the South is planned by the Mason & Dixon Air Line Inc., recently incorporated at Columbus, Ohio, by Albert L Russell, Morss Lippincott and John H More, local attorneys. The stock listing was given as 3 000 shares of no par value.

Lexington, Ky., will be a main port on the new line, it was said. While the attorneys said they could make public no details J Dixon Davis and other officials of the Davis Flying Field, Cincinnati were said to be backing the new project. Details are expected soon.

T.A.T. Launches Transcontinental Air-Rail Schedule

The first operation of Transcontinental Air Transport's service will start tomorrow, July 7, when the Airway Limited pulls out from the Pennsylvania Station New York. The next morning it will arrive in Columbus, Ohio where passengers meet the transport planes. The complete story of the operation is covered elsewhere in this issue. Following is the timetable which will be observed throughout the line.

Westbound Read Down				Eastbound Read Up
		Pennsylvania Railroad		
"The Airway Limited"				
6 05 p m ET	Lv	New York City	Ar	9 50 a.m ET
Dinner and Breakfast on P R R Dining Car				Dinner and Breakfast on P R R Dining Car
7 55 A M ET	Ar	Port Columbus		7 46 p m ET
		(A new station stop 8 mi East of Columbus)		The Airplane Limited
		Transcontinental Air Transport Inc		
8 15 a m ET	Lv	Port Columbus	Ar	7 26 p m ET
9 13 a m CT	Ar	Indianapolis	Lv	4 49 p m CT
9 28 a m CT	Lv	Indianapolis	Ar	4 34 p m CT
12 01 p m CT	Ar	St Louis	Lv	2 29 p m CT
12 16 p m CT	Lv	St. Louis	Ar	2 14 p m. CT
Fred Harvey luncheon on plane				Fred Harvey luncheon on plane
2 56 p m CT	Ar	Kansas City	Lv	12 04 p m CT
3 11 p m CT	Lv	Kansas City	Ar	11 48 a m CT
5 06 p m CT	Ar	Wichita	Lv	10 14 a m CT
5 21 p m CT	Lv	Wichita	Ar	9 59 a m CT
6 39 p m CT	Ar	Airport Okla	Lv	8 55 a.m. CT
		(Terminal field stop 6½ mi east of Waynoka Okla)		
T.A.T aero car service to Harvey House for dinner				T A T aero car service to Airport Okla
		Atchison, Topeka & Santa Fe Railway		
Set-out Pullman ready "The Missionary"				Breakfast in Harvey House
11 00 p m CT	Lv	Waynoka Okla	Ar	8 18 a.m CT
8 25 a m CT	Ar	Clovis N M	Lv	11 35 p m CT
Breakfast in Harvey House				Set-out Pullman ready "The Scout"
		Transcontinental Air Transport, Inc		
T A T aero car service to Portair N M		(Terminal field 5 mi west of Clovis, New Mex.)		T A T aero car service to Clovis N M
8 10 a m MT	Lv	Portair N M	Ar	8 00 p m MT
10 43 a m MT	Ar	Albuquerque, N M	Lv	5 49 p m MT
				Fred Harvey dinner at Albuquerque airport
10 58 a m MT	Lv	Albuquerque N M	Ar	5 19 p m MT
1 41 p m MT	Ar	Winslow Ariz	Lv	2 59 p m MT
1 56 p m MT	Lv	Winslow Ariz	Ar	2 44 p m MT
Fred Harvey luncheon on plane				Fred Harvey luncheon on plane
3 06 p m. PT	Ar	Kingman Ariz	Lv	11 51 a m PT
3 23 p.m. PT	Lv	Kingman Ariz	Ar	11 36 a m PT
6 42 p m PT	Ar	Los Angeles	Lv	8 45 a m PT

Combine Night Coach And Plane Transport

LOS ANGELES (CALIF.)—A combination air and motor coach service has been placed in operation between San Diego, Calif., and Portland, Ore., by the Pickwick Corporation, as a result of the inauguration of NiteCoach service between this city and San Francisco.

Dedicatory services having been held at the Grand Central Air Terminal, the first coach left on June 26 at 6 30 p m for San Francisco, arriving there at 9.30 a m the following morning.

Fitting ceremonies also were held in San Francisco whence the first coach departed on June 27 at 6 30 p m., arriving in this city at 9 30 a m. the following morning.

The new NiteCoaches will carry 28 passengers and a crew consisting of driver, porter and steward.

The plane leaving San Diego in the afternoon arrives in Los Angeles in time to connect with the 6 30 p.m NiteCoach, and that in turn reaches San Francisco in time to connect with the plane leaving there in the morning for Portland.

Open Rio Line December 1

NEW YORK (N. Y.)—December 1 has been set as the date for the opening of the service between this country and South America which the New York, Rio and Buenos Aires Lines is developing. Ford transports will be used for all of the distance except the over water jumps, it is said. Seven Fords have been ordered. Within eight months after starting the service, it is expected that the time for the trip will be cut in half by extensive lighting equipment to be installed.

Martin Starts Service

CLEVELAND (OHIO)—John Martin, of Willoughby, Ohio, has announced a passenger service between that city and the local municipal airport to connect with the 10 a m amphibion passenger plane of the Thompson Aeronautical Corporation's Detroit-Cleveland line. The passenger service announced by Martin will serve the four towns of Painesville Mentor Kirtland and Willoughby, all of which are within a radius of 8 mi.

Curtiss Offers Blimp Hangar Site

MIAMI (FLA.)—Glenn H Curtiss, appeared before the city commission recently to offer a site for the dirigible hangar now at Key West, if the city will move it to Miami. The Goodyear-Zeppelin Corporation would use it for the storage of a sight-seeing and training dirigible.

Demonstrate Crouse-Hinds Light

OMAHA (NEB.)—A 5,000 watt lamp recently was erected for demonstration purposes by the Crouse-Hinds Company at the Omaha Municipal Airport. Lighting specifications for the field call for a 90 deg lamp, while this one covers a 180 deg arc

FOREIGN ACTIVITIES

Spanish Flyers Rescued Off Azores

MADRID (SPAIN)—Following a week adrift in their Dornier-Wal flying boat, the four missing Spanish flyers were rescued June 29 by the British aircraft carrier "Eagle" near Santa Maria, of the Azores group, according to advises received here Word of their safety was received with rejoicing after the long uncertainty in which the attempted trans-Atlantic flight ended

Brief despatches state that Maj Ramon Franco, Comdr Ruiz de Alda, Captain Gallarz and Mechanic de Madariaga were forced down out of fuel on June 22 while trying to make Fayal The flyers had left Los Alcazares on June 21 They missed the Azores in the darkness and at dawn found themselves to be southwest of the islands A landing was made to further study their position and then the attempt was made to reach Fayal, the fuel running out after they had flown about 40 mi

The machine drifted out of control until the rescue was effected by one of the units of the largest searching party sent out since that following the ill fated Italia expedition The machine was powered with two 600 hp engines in tandem

Lord Thompson Named English Minister for Air

LONDON (ENGLAND)—Lord Thompson, who was Air Minister under the former Labor Government, has been selected for that office again, following the party's return to power He has had a long association with English aviation in various offices including that of chairman of the Royal Aero Club

During his previous term as Secretary of State for Air, Lord Thompson was credited with having been a major factor in the revival of a British lighter-than-air program. There is considerable expectation that aviation will experience expansion under the new regime The new minister represented this country at the Washington conference in December

Sverige Held by Trouble

REYKJAVIK (ICELAND) — Following repeated failures to make successful repairs that would enable the Swedish trans-Atlantic plane to continue its flight to this country, Captain Ahrenberg and his crew are now awaiting further extensive replacements and testing The flight of the Sverige will be continued as soon as conditions are satisfactory

Test Heinkel Catapult on Bremen

BERLIN (GERMANY)—A Heinkel seaplane was catapulted recently from the new Heinkel launching device, which has been installed for regular service on the steamship Bremen The test was reported to have been successful Extensive use of the seaplane on ship-shore service is planned when the liner is placed in trans-Atlantic service soon

Record Entries For King's Cup Race

HESTON (ENGLAND) — The eighth King's Cup Race is to be staged July 5 and 6 with this community and the starting and finishing point. A record number of entries, 56 machines, will be flown in the two-day event involving about 1,179 mi extending, in general, around the border of the country In connection with this race will be the competition for the Siddeley Trophy, for light planes only

The first day's flying will cover 595 mi. into northern England and part way back along the west coast The machines will cover 584 mi. the second day The majority of the entries are light planes, there being 21 Moths, 8 Avians 5 Simmonds Spartons, 4 Widgeons, and others Four new types will be displayed for the first time The King's Cup Race is a handicap contest.

To Search For Italia Victims

MOSCOW (RUSSIA) — An extensive polar flight to aid the Karsky expedition is planned by Ivan Chukhnovsky, Soviet aviator who first discovered the Malmgren group of the ill-fated airship, Italia it was learned here recently Pilot Chukhnovsky expects to fly from Leningrad to Novaya Zemlya Using the geographical observatory there as a base, he will aid the expedition which will study the Karsky ice region The expedition is scheduled to leave on the ice-cutter, "Krassin," July 9

Bengal Firm Starts Line

CALCUTTA (INDIA) — An experimental air service between this city and Siliguri, the terminal of the Eastern Bengal Railway, has been started by the Bengal Air Transport Company These operations are regarded as important in the aviation development of India.

Italians Honor Malmgren

ROME (ITALY)—A gold medal for civic valor has been awarded posthumously to Dr Finn Malmgren, Swedish scientist with the Nobile expedition who was lost following the destruction of the airship

International Group Legislates at Paris

PARIS (FRANCE)—The International Aeronautical Commission held its sixteenth session at Paris June 11-14 and passed several amendments and additional clauses with respect to the Aeronautical Convention Act of Paris of October 13, 1919 Revised clause 31 stipulates that any aircraft, piloted by a military person in actual service is considered to be a military airship

New clauses 41 and 42 deal with admission to the Convention Airships of nations not being parties to the Convention are not allowed to fly over the territory of treaty-making powers unless with special grant or commanded by a registered pilot. Clause 34 regulates the powers of the International Commission under the League of Nations and clause 36 proceedings in case of differences about the interpretation of any stipulations of the international convention and appeal to the International Court at the Hague

Imperial Airways Names Agent

LONDON (ENGLAND)—A new aviation concern, to be known as Imperial Airways (South Africa) Ltd, has been formed here to act as the agent in South Africa of the well-known Imperial Airways company here and to conduct in that country an air transportation service It will undertake also to manufacture, repair and deal in aircraft and construct airdromes. Control is to be rigidly reserved for British subjects, which includes subjects of the Union of South Africa.

Southern Cross Renews Attempt

SINGAPORE (STRAITS SETTLEMENT) —The crew of the Southern Cross, freed of the charges which grew out of the failure of its first attempt to fly from Australia to England, has passed through here and started on its goal by way of the Malay Peninsular and India The previous flight had ended in a forced landing and two rescue pilots had died trying to reach them Charges were that the forced landing was unnecessary and a publicity stunt.

French Plan India Line

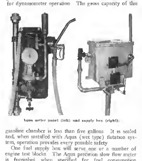
PARIS (FRANCE) — The French Air Ministry has announced its new program on commercial air services Within a few months air service between Marseilles and India will be inaugurated, air traffic between Beirut, Syria, and Rangoon to be performed in conjunction with the English Imperial Airways, operating that route

THE BUYER'S LOG BOOK

Aqua Fueling Equipment

TWO new fueling devices are now being offered by the Aqua Oil Service, Inc, 2 Lafayette St, New York, N. Y One of these is an automatic gasoline supply for engine testing, and the other a meter panel for wall mounting

The engine testing equipment provides continuous gasoline feed under constant head, the ideal conditions for dynamometer operation The gross capacity of this



Aqua meter panel (left) and supply box (right)

gasoline chamber is less than five gallons It is sealed and, when installed with Aqua (wet type) flotation system, operation provides every possible safety

One fuel supply box will serve one or a number of engine test blocks The Aqua precision slow flow meter is furnished when specified for fuel consumption records

The gasoline meter panel meets the demand for a gasoline dispensing outlet mounted on the hangar wall for rapid filling of portable field trucks When this unit is equipped with a long hose, planes may be fueled near the hangar This panel may be connected to the gasoline line of any Aqua system and is especially desirable where deep snow would interfere with pit box or field portable fueling operations

Wilkins Oil

IN RESPONSE to the demands of purchasers of aircraft instruments, the Pioneer Instrument Company, 754 Lexington Ave, Brooklyn, N. Y, is now offering Wilkins Oil, a special aircraft lubricant developed by the company This oil was originally intended for use only in the assembly of Pioneer instruments It is now available, however, in 2 oz cans with cap and spout

This oil remains fluid and retains its lubricating qualities through a temperature range of — 40 deg to + 50 deg. C which is adequate for aircraft operation

Black & Decker Valve "Pilot"

THE "Self Centering Aircraft Pilot" developed by the Black & Decker Manufacturing Company, Towson, Md, has been designed especially to insure accurate valve reseating which is vitally important on aircraft engines. This device, which is automatic in operation, is the companion to the Black & Decker Valve Refacer which is used to regrind the face of the valve which is accurately centered to its stem

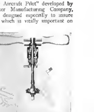


Diagram illustrating use of the Self Centering Pilot

The Self-Centering Aircraft Pilot consists of a pilot stem which is centered in the guide by means of two cones snugly fitting the pilot and serving as a bearing for it These cones are automatically held in place in the guide by means of springs The turning handle is quickly attached to the pilot stem by means of a ball chuck and a positive even speed is given the reamer by the feed screw With this pilot is used the Black & Decker high-speed tungsten steel reamers which are intended for smooth cutting on the bronze seats of aircraft engines Three sizes of pilots are required to fit all types of aircraft engines, each pilot having a range of ⅛ in

Starrett Micrometers Improved

AN IMPROVEMENT on micrometers has been announced by the L S Starrett Company, Athol Mass This improvement is provision of half thousandths divisions on the spindle and may be had on any Starrett micrometer excepting Nos 238 and 239

Starrett micrometer No 436 may now be had with the lock nut feature A knurled locking nut contracting a split bushing around the spindle tightens and keeps the spindle central and true and by a slight turn locks it firmly making a solid gauge when desired

The No. 440 Starrett micrometer depth gauge can now be furnished with ratchet stop which permits the same degree of pressure at point of contact in measuring By this means a more accurate reading is assurred eliminating the chance of unequal "feel"

A feature which will be useful to instructors and apprentices and may be desired by some mechanics is micrometer graduation where the intermediate lines of the spindle denoting thousandths are numbered consecutively This method of marking may be had on all Starrett micrometers excepting the Nos 238 and 239.

Novalux Airport Ceiling Light

IN ORDER to determine the approximate height of fog or clouds above the ground, so that this information can be transmitted along the airways, ceiling lights are used at many of the larger airports. A light of this type has been developed by the General Electric Company and is known as the GE Novalux airport ceiling light

Novalux Ceiling Light

The Novalux ceiling light has a non-corrodible aluminum alloy drum attached to the side of which is a quadrant This is provided with three tapped holes each of which is marked with the measure of the angle at which the beam may be elevated when a threaded clamp screw on the arm engages Several methods of triangulation are used in connection with these lights These holes provide for beam elevation above the horizontal of 63 deg 26 min, 45 deg and 26 deg 34 min, these being the standard angles used in the system of ceiling height determination

The front door glass is heat resisting and is of convex shape to provide additional strength This glass is mounted on a frame which is hinged to the drum and a rubber gasket is placed between the door frame and the drum to exclude moisture. A focusing mechanism is provided so that the lamp can be focused in the mirror from outside the drum as the vertical adjustments have been made inside.

When the ceiling light is set as an angle of 63 deg 26 min an indicator is usually used in conjunction with this which will read ceiling heights directly on a scale.

The incandescent lamp specified by the Department of Commerce Rating Regulations for airport use are the 110 volt, 250 watt G-30 bulbs, mogul screw base spotlight, 3⅜ in light-center length, or the 12 volt, 35 ampere lamp with G-25 bulb, mogul screw base and 3 in light-center length

Flying Suits for Women

ONE of the first department stores to design and stock a complete line of flying clothing for women is B Altman & Company, Fifth Avenue at 34th Street, New York, N Y

The summer flying suits for women are attractive designs in white gabardine so styled that they can easily be slipped over street or sport dresses. Each model has zipper fasteners from the shoulder to the waistline and at the ankles There are shoulder straps by which the parachute pack may be held firmly in place Commodious pockets have either flaps with buttons or zippers

The gabardine helmets are snug fitting and have protective ear pads Several standard makes of goggles also are kept in stock

In addition to the domestic designs, Altman recently included in an aviation window display several original imported outfits by a Paris couturier

Ideco Beacon Towers for T. A. T.

THE Beacon Towers built by the International Derrick & Equipment Co of Columbus, Ohio, for Transcontinental Air Transport, Inc, are made to the specifications of the Lighthouse Division of the Department of Commerce and are identical with those used for the lighted airways The towers are 51 ft high, built of hot dip galvanized structural steel upon which are mounted motor driven rotating beacon lights of 2,000,000 cp and two course lights, as well as a wind cone The towers are set in concrete bases made in the shape of an arrow pointing the direction and numbered for identification by the pilot Wherever possible, electricity is purchased from power companies, but where this is not available, small portable lighting units are employed and housed near the lights

The short 20 ft blinker towers are built with a housing in their base They support acetylene blinker lamps, the same type as are used in lighthouse service These blinkers are operated by an automatic sun valve, which turns on the light as darkness approaches. A six months' supply of gas is placed in the house in the base

Radio beacon towers have been installed at Columbus, Ohio, Indianapolis, Ind, Wynoka, Okla Clovis and Albuquerque, New Mexico, and at Winslow and Kingman, Ariz, augmented by similar towers erected for the Department of Commerce at Anglum, St Louis, Wichita and Kansas City

The Ideco Radio Towers are 125 ft tall, built of galvanized structural steel and are painted with broad stripes of white, black and chrome yellow

Scully "Air Mail" Helmets

SEVERAL types of helmets are included in the sporting goods products manufactured by Scully Bros., Inc, 725 East Washington Street, Los Angeles, Calif. Scully "Air Mail helmets are made in a variety of materials for various purposes Three standard sizes are available The small type for sizes 6¾ to 7, medium for sizes 7⅛ to 7¼, and the large for sizes 7⅜ to 7½ An extra small type for sizes under 6¾ and an extra large type for sizes over 7½ also are available The company also manufacturers leather face masks which cover the entire face and chin and have removable mouthpiece.

Among the features claimed by the manufacturer of these helmets are, snug tailored fit around the forehead and chin, a cupped recess for the ears which cannot be pulled out of shape, a special method of binding which places the strain exerted by the pull on the chin strap only on the outer edge of the helmet, and a reinforcement which is said to stop the annopyng wind flutter on top of the head A feature in the helmets for winter use are the "wind wings" designed to protect the face against gales

Resistal Seymour Goggles

ANNOUNCEMENT recently was made by Strauss & Buegeleisen, 30 Front Street, Brooklyn, N Y. of the addition to their line of a new type of goggle in four styles This goggle is known as the "Resistal Seymour," styled as DEM-DEV-CET-DEK According to the manufacturer the advantages of this goggle are increased angle of vision 30 per cent in all directions.

the radio directions guiding the giant T. A. T. airliners come from towers built by IDECO.


T. A. T. Radio Beacon Tower
Ideco Built
Columbus Ohio

Swinging out into the night, mail, transport, and Army pilots follow the beacons—Light Houses of the Air—built by IDECO.


Lighthouse of the Air
Ideco Beacon Tower
Tehachapi Mts

The U. S. Department of Commerce use IDECO Beacon and Radio towers on all the airways. Many are used on municipal and private airports. They are used by the T. A. T. between Columbus and Los Angeles.

IDECO Hangars and airport buildings,—attractive, fire-safe and economical, are widely used by private and Municipal Airports, Flying Schools and Air Transport lines.

International will furnish all the equipment, from a single hangar to a complete airway.

THE INTERNATIONAL DERRICK & EQUIPMENT COMPANY
COLUMBUS, OHIO LOS ANGELES, CALIF.
NEW YORK, DETROIT, WICHITA, TULSA, SHREVEPORT, FT. WORTH, HOUSTON, DENVER, LOS ANGELES

KILL FIRE WHILE IT IS YOUNG

FIRE!
A disaster or an incident to your airport?

It can be whichever you choose! Disaster if the airport upon which money has been spent so hopefully becomes a dark, smouldering blot which flyers must pass by.

An *incident* if you are equipped with the proper fire extinguishing equipment—to kill fire at its most susceptible moment—its start!

American-La France and Foamite Products include every recognized type of fire fighting equipment from one quart extinguishers to the largest motor fire apparatus, used by 90% of America's cities. Whether you need "first aid" fire equipment, an automatic system or motor fire apparatus, which can quickly be rushed to any part of your airport, you will find an American-La France and Foamite product that exactly fits your needs—a product backed by over 84 years' experience in the one business of fighting fires! American-La France and Foamite recommends and installs this equipment; instructs your employees in its proper use; if desired, services equipment at regular intervals. Let one of our engineers talk over your airport protection problem with you. It obligates you in no way.

A booklet "Sinister Beacons" describes airport hazards and the correct fire protection for these hazards. American-La France and Foamite Corporation, Engineers and Manufacturers, Dept. T51, Elmira, N. Y.

AMERICAN-LA FRANCE AND FOAMITE PROTECTION
A Complete Engineering Service
For Extinguishing Fires

American La France and Foamite Corporation
Dept. T51, Elmira, N. Y.
☐ Please send me your booklet "Sinister Beacons."
☐ Have a Fire Protection Engineer call.
Name ____________
Company or City Dept. ____________
Town or City ____________
State ____________


American
Hammered
Piston Rings
are used in
PRATT & WHITNEY
Engines

OUT IN 5 SECONDS

A PHYLAX fire-extinguishing system gives absolute protection to pilot, passengers and plane . . . . from fire in the air. Because—should fire start—in any part—PHYLAX puts it out in 5 seconds. The flame itself is the perfect fireman. Its heat instantly releases the extinguishing liquid, which as quickly kills, smothers, obliterates—the pilot's deadliest menace. PHYLAX is the flyer's only air protection. Made automatic so that the pilot can concentrate on his controls—PHYLAX can also be operated by hand or electricity. Mechanically absolute in action—PHYLAX is always on guard, detecting and extinguishing the first flame-flicker—even though the pilot may not see it. Insurance may pay for your plane or for your life. But PHYLAX alone protects and saves both—property insurance and safety assurance combined. PHYLAX will meet your every expectation, and at the surprisingly low cost of only $70 for an air-cooled engine installation or $80 for a water-cooled engine installation. Write for full particulars.

PHY-LAX

A PHYLAX fire extinguisher installation consists of a tank (T), containing the extinguishing liquid, mounted in the pilot's cockpit. Connected to the tank (T) are two copper pipe lines—pressure line (PL) and sprinkler line (SL). At the ends of the pressure line (PL) are two or more fuses positioned where fire is most likely to originate. At the ends of the sprinkler line (SL) are one or two sprinkler heads (S) positioned to cover the strategic points of the engine—carburetor and oil sump. When any fuse (F) is attacked by fire, it automatically sets the PHYLAX system in operation.

AERO SUPPLY MFG. CO., INC.

COLLEGE POINT · LONG ISLAND · NEW YORK

A LANDING FIELD FLOODLIGHT WITH A 180-DEGREE SPREAD

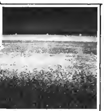
The Type AKP24 landing field floodlight has been built around an entirely new principle and design. The glass reflector is of such design that the vertical spread is limited to a very few degrees but the horizontal spread is 180-degrees. This projector was designed particularly for lighting the landing area of an airport where a wide spread light of even distribution and of sufficient intensity to permit safe landings is required.

The housing is of cast aluminum alloy except the back which is of lead-coat sheet steel.

The focusing mechanism is three-way hand operated from the bottom of the housing. The lamp may be focused in the daytime.

The mounting consists of a slip fitter base for 4-inch pipe, having a 1½-inch tapped hub in the side which can be used in case wires are brought up through the supporting pipe.

Louvers are provided for cutting off all spill light above the horizontal.



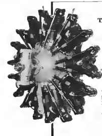
CROUSE-HINDS COMPANY
ESTABLISHED [illegible]
SYRACUSE N Y U S A
SALES OFFICES
NEW YORK BOSTON CHICAGO
PHILADELPHIA DETROIT PITTSBURGH CINCINNATI
CLEVELAND ATLANTA ST LOUIS MINNEAPOLIS
MILWAUKEE SAN FRANCISCO

Everything in lighting equipment for airports and airways

CROUSE-HINDS

CONDULETS · GROUNDULETS · PLUGS and RECEPTACLES · FLOODLIGHTS · TRAFFIC SIGNALS
AIRPORT and AIRWAY LIGHTING EQUIPMENT · PANELBOARDS and CABINETS · SWITCHES

C-H447



THE PRATT & WHITNEY AIRCRAFT CO.
HARTFORD, CONNECTICUT
U S A
CABLE ADDRESS "AIRCRAFT"

May 31, 1929

VICE PRESIDENT
IN CHARGE OF MANUFACTURING

U. S. Hammered Piston Ring Co.,
Mr. A. W. Wenzel,
Paterson, N. J.

Gentlemen:

In view of the personal attention you have always given our piston ring requirements, it is only right that we admit to you that our orders have always been highly exacting as to quality and that many of them have been unusual as to their time requirements.

We wish to thank you for your co-operation, but, at the same time, we wish to call your attention to the fact that we are planning to materially increase our schedule of production on aviation engines in the near future. This will result in even greater demands upon you, since we are today entirely dependent upon you for our piston ring needs.

We should imagine that it is a matter of pardonable pride to you that U. S. Hammered Piston Rings are today in service in Pratt & Whitney aviation engines flying over most of the important transportation lines in this country.

Very truly yours,

D. L. Brown

D. L. Brown, Vice-President
PRATT & WHITNEY AIRCRAFT COMPANY

DLB:P

Oil Shall Not Pass
U. S. HAMMERED PISTON RING CO.
ST PETERSBURG FLA
PATERSON, N J

June 3, 1929.

Pratt & Whitney Aircraft Co.
Mr. D. L. Brown, Vice-President
Hartford, Conn.

Dear Mr. Brown:

We confess we are human enough to be proud of your letter to us of May 31st.

The realization that both our piston rings and our service have measured up to the high Pratt & Whitney standards is good business; but to have you go out of your way to tell us both facts is infinitely satisfying.

On the other hand, we want you to realize that we are strictly in step with the phenomenal growth in aviation of Pratt & Whitney since, within the past month, we have moved into our new factory at Paterson, N. J., where we now have a capacity of 80% more piston rings a day.

In addition, we expect in the near future to open our second new factory at St. Petersburg, Florida, which will increase our daily capacity by an additional 60,000 to 75,000 piston rings.

As a result of these increasing facilities, we feel certain that we will be even better equipped to serve you in the future than in the past, not only along production lines but also in experimental work as well.

Very truly yours,

A. W. Wenzel

A. W. Wenzel, President
U. S. HAMMERED PISTON RING CO.

AWW/ee

U. S. Side hammered rings hold compression under abnormal heat, have no hammer marks or fractured metal and have a true circle, flat surface and uniform wall thickness.

U S AVIATION HAMMERED PISTON RINGS

U. S. Hammered Piston Ring Co., Paterson, N. J.

THANK YOU for mentioning AVIATION

Another Victory
for the
Aristocrat!

Quality Wins!

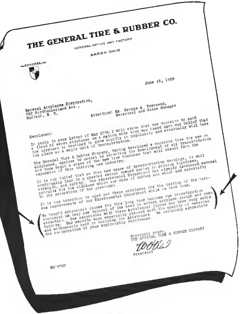
*** General Tire and Rubber Company buys fleet of seven Aristocrats.**

Most eagerly sought order of the year goes to the General Airplanes Corporation in open competition with the country's foremost makes of planes.

** General Tire & Rubber Company is not affiliated in any way with the General Airplanes Corporation*

GENERAL AIRPLANES CORPORATION, *Buffalo, N. Y.*

President Tells Why He Bought Fleet of Aristocrats for the World's Greatest Air Tour



THE GENERAL TIRE & RUBBER CO.
GENERAL OFFICE AND FACTORY
AKRON OHIO

THE GENERAL TIRE

June 15, 1929

General Airplanes Corporation,
622 Northumberland Ave.,
Buffalo, N. Y.

Attention: Mr. George A. Townsend,
Secretary and Sales Manager

Gentlemen:

In reply to your letter of May 27th I will state that our decision to send a fleet of seven airplanes on a nation wide tour was based upon our belief that the airplane is destined to grow rapidly in popularity and eventually will take its place as a major unit of transportation.

The General Tire & Rubber Company, having developed a superior tire for use on airplanes, desires to assist in promoting the development of air transportation and thus merit a share of the new tire business that will result from the expansion of this thriving new industry.

It is our belief that as this new means of transportation develops, it will continually lean to a greater extent toward rubber in gaining lightness, strength, and safety. Our experimental Department has already developed several products for the airplane which are made of rubber and which add materially to the protection of the personnel.

It is our intention to also use these airplanes for the testing of the various improvements of our Experimental Department while on this tour.

We bought Aristocrat planes for this long tour because our investigation convinced us they are typical of the best in modern airplane design and construction. Our experience with these Aristocrat planes has been very satisfactory. Our experts were especially pleased with the quality of material and workmanship used in building the Aristocrat. We certainly appreciate the co-operation of your engineering department.

Sincerely yours,
THE GENERAL TIRE & RUBBER COMPANY
W O'Neil
President

WO'N*MP

GENERAL AIRPLANES CORPORATION, *Buffalo, N. Y.*

Miller
AIRPLANE PRODUCTS
Again Lead!

As is evidenced by the accompanying letter from our Jacksonville, Florida, dealer, Dr. Ralph Greene:

Mr. Leslie C. Miller,
Miller Airplane Products,
3827 West Jefferson Street,
Los Angeles, California.

Dear Mr. Miller:

"I presume you noted where Laurie Yonge flew twenty-five hours and five minutes in an OX-5 Curtiss-Robin Monoplane. The Overhead you build was used, lubricated with Veedol super heavy lubricating grease. At the end of the flight the oil cups were only half empty.

"If you would be interested in having Mr. Yonge give you a certificate, etc., he would be glad to do this for you.

"The Overhead had a lot of time before the flight and still looks as good as new.

"With kind personal regards,

Sincerely yours,

RHG/b RALPH H. GREENE" (Signed.)

HUNDREDS of OX-5 owners are now enjoying unbelievable performance from their motors due to our equipment. Test-runs in our own factory give us reason to believe that every existing solo endurance and refueling record can be broken with a properly MILLER EQUIPPED OX-5 MOTOR.

This statement is not egotism on our part, but the result of facts we have learned in connection with our products. To anyone interested we would be glad to supply, free of charge, all information necessary for the proper redevelopment of your OX-5 for endurance flying.

YOUR MOTOR'S EFFICIENCY CAN BE GREATLY IMPROVED BY THE USE OF THE FOLLOWING:

"Rev's for OX-5," by Leslie C. Miller, covers methods of improving power, reliability, and economy; price $1.00.

Miller Overhead Assembly, many times outlasts original Overheads.

Miller Roller Rocker Arms, save the Valve Guides.

Miller Intake Valve Controls, increases revs and saves gas.

Miller Valve Guides and Seats put the cylinders back in service.

Miller 3 Ring, Medium High-compression Pistons, increase power.

Miller Valve Guide Jig, for replacing Guides in your own shop.

Miller Valve Seat Set, in conjunction with the Guide Jig replaces the seats.

Miller Reamer Sets, etc., are indispensable when grinding valves.

We also sell numerous other necessities, including the German Bosch Magneto, Bosch Spark Plugs, Bosch Ignition Cable, and last but not least the Bosch Breaker Assembly to fit Berling Magnetos.

Write or wire to us direct, or to any of our representatives, for descriptive folder and price list.

MILLER AIRPLANE PRODUCTS

3827 West Jefferson Street, Los Angeles, California

Phone, Empire 3570

DISTRIBUTORS:

Logan Aviation Co., 716 West Superior Ave., Cleveland, Ohio
Johnson Airplane & Supply Co., Dayton, Ohio
Nicholas-Beazley Airplane Co., Inc., Marshall, Missouri
Robertson Aircraft Corp., Anglum, Missouri

BAKER'S A-A Castor Oil
Carried the Yellow Bird over!

Behind their magnificent flight of 3128 miles across the Atlantic,—June 13-16 lay the supreme confidence of the fliers in their plane, engine and Baker's A-A Castor Oil engine lubricant.

They had carefully selected this oil after thorough tests, for the Yellow Bird's 600 H.P. Hispano-Suiza engine.

Below from left to right are Armeno Lotti, Co-pilot and backer of flight; Jean Assolant, Pilot; Rene Lefevre, Navigator.

THE BAKER CASTOR OIL CO.

Founded 1857

The Oldest and Largest Manufacturer of Castor Oil in the United States

120 BROADWAY **NEW YORK**

12 + 12

REASONS FOR THE FLAMINGO

EARNING POWER

1. Lowest cost of operation per passenger mile of any transport plane in its class.

2. Low first cost per passenger, $3,000 with Wasp, $3,400 with Hornet, including the protection of ALLMETAL construction.

3. Passengers attracted by the safety of ALLMETAL.

4. With decreasing mail rates, the extra earning power of combined mail and passenger loads is essential to the most profitable operation. Room for 500 pounds mail.

5. Freedom from pitching and rolling decreases air sickness.

6. Passengers appreciate comfort of roomy chairs with head rests.

7. This seven passenger plane is a size ideal from a profit earning standpoint, for the volume of traffic that is generally available now, reducing to a minimum the overhead of empty seats per trip.

8. Fluctuating traffic loads, necessitating increase in service, can be more profitable accommodated with several units of this type of seven passenger plane.

9. Risk overhead both as to passengers, personnel and equipment, is lower than with larger transports.

10. Decreased fire risk both in air and on the ground due to ALLMETAL construction.

11. Less initial investment is necessary with planes of ALLMETAL construction, due to decreased maintenance and elimination of annual plane overhaul which means "no time out," making fewer operating units necessary for a given service than if fabric planes were to be used.

12. Fast economical cruising speed 110-115 M. P. H. with Wasp, 115-120 with Hornet or Cyclone.

FLYING FEATURES

1. Exceptionally clear vision in all directions eliminating blind spots.

2. Quick take off with heavy load - - safety in small fields.

3. Fast rate of climb means the reaching of safe altitude more quickly.

4. The excellent lateral and longitudinal control eliminate flying effort on part of pilot, also invaluable in blind flying.

5. Dual control for safety and convenience.

6. The medium landing speed and controlability at low speeds assure a greater margin of safety in using small fields.

7. Wide ten foot tread between landing wheels prevents ground looping and facilitates cross-wind landings.

8. Eight inch, oversize tires give added safety on rough, muddy or sandy fields.

9. Pneumatic tired wheel tail skid and individual Bendix brakes save time and man power in ground maneuvering.

10. Pilots appreciate the individual pilot's door immediately at their left.

11. Pilots appreciate the increased safety of ALLMETAL construction. (The Flamingo is entirely made of metal - - metal structure and metal skin throughout.)

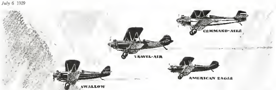
12. Large ventilator in ceiling giving complete circulation of air in cabin.

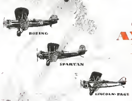
HIGH SPEED 135-145; CRUISING 110-120

PILOT, 7 PASSENGERS; 500 LBS STORAGE

ALLMETAL FLAMINGO

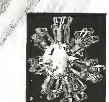
The METAL AIRCRAFT CORP.
CINCINNATI





choosing AXELSON Engines

"POWERED BY AXELSON"—is an asset sought by the leading airplane manufacturers building ships requiring 150 H.P. Orders booked far into the future call for delivery on a steady, uninterrupted schedule to those outstanding aircraft builders. Present production in the Axelson plant is being consistently increased to meet this phenomenal demand.



THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

Axelson Machine Company
Factory and General Offices
Corner Randolph St. and Boyle Ave.
Los Angeles, California
(P. O. Box 337)

AXELSON AIRPLANE ENGINES

Pacemaker of the Air

You May Indeed
Expect Great Things
of the New
B/J

EXPECT great things! B/J is at work to-day on the plane that will set the standards of to-morrow. To that end there have been drawn together in this company one of the most able and experienced groups of men in the industry, including such master aircraft designers, engineers and builders as—

W. W. Moss, President, thoroughly experienced in the executive requirements of aircraft manufacture, sale and finance, is at the controls as President of the B/J organization,

William Wait, Jr., Chief of Design, design engineer of some of the most successful and best-known airplanes, including Schneider and Pulitzer Trophy racers,

Harold A. Backus, Chief of Materials, a former chief metallurgist and general engineering consultant on materials, processes and finishes,

Frank S. Hubbard, Chief Engineer, a former technical department executive head, and consultant on design,

Thomas E. Pell, Factory Superintendent, formerly factory superintendent of the Naval Aircraft Factory at Philadelphia,

Temple N. Joyce, Vice-President, who gained an international reputation as a test pilot for the army during the war.

Such men as these, joined together in a balanced staff, have set themselves to the task of making the new B/J "*The Pacemaker of the Air.*" You may, indeed, expect great things of the new B/J.

HENRY A. BERLINER,
B/J *Vice President, in charge of Production*

EARL F. OSBORN
B/J *Chief of Structures*

WILLIAM H. MILLER
B/J *Chief of Research*

COMING events cast their shadows before—and there is coming not only the new B/J Plane but the new B/J sales plan and advertising, establishing for B/J Planes a pacemaking position in the consciousness of airminded Americans. Built in a new quarter-million dollar plant with every facility for high-quality, low-cost production, B/J Planes will be "Pacemakers of the Air" in saleability as well as in performance. Write to G. Roger Coats, Commercial Sales Manager, Berliner-Joyce Aircraft Corporation, Baltimore, Md., for advance information about the B/J sales plan.

The WACO 220 Taperwing ... *and* ... SOLOTEX

QUALITY *above everything*

From the time the raw cotton is bought until the neatly packed roll of SOLOTEX is shipped from the mill, one idea governs its making . . . . *quality.*

The SOLOTEX process calls for the finest Egyptian cotton selected by buyers who put quality first and cost last. This selected cotton is handled in a scientifically perfected process;—combed, spun, twisted and woven to an exact formula which cannot be excelled . . . . in every step.

QUALITY *above everything*

SOLOTEX

fabric

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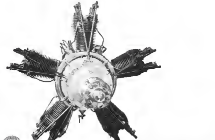

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FIG. 849—"HALLOWELL" STEEL BENCH DRAWER FOR STEEL TOPPED WORK-BENCHES AND TABLES.

Key A—Runner B—Master Keyed Lock C—Catch for Bolt of Master Keyed Lock D—Tray E—Cover

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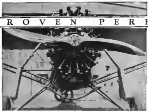

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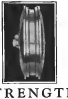

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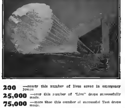

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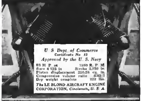

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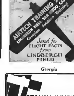

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Standard J-1	Bi.	Open	2	....	Overhauled OX 5	New	$1,500	St Louis
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International	Bi	Cabin	6	C3266	90 hr W. W. J5	90 hr.	$4,500	St. Louis
Lockheed Vega	Mono.	Cabin	6	NC7953	125 hr Wasp	120 hr	$17,500	St Louis
Ryan	Mono	Cabin	5	C3423	50 hr W. W J5	250 hr	$6,500	St. Louis
Cessna	Mono	Cabin	4	NC6442	125 hr W W J5	111 hr	$7,000	St. Louis
Fairchild	Mono	Cabin	5	C4441	80 hr W W J5	75 hr	$7,000	St Louis
Curtiss Robin	Mono	Cabin	3	C124E	20 hr OX 5	18 hr	$3,400	St Louis
Ryan	Mono	Cabin	5	C4654	125 hr W W J5	275 hr	$5,000	Oklahoma City
Ryan	Mono	Cabin	5	C1787	Reblt W W J5	500 hr	$5,500	Oklahoma City
Lockheed Vega	Mono.	Cabin	5	C7426	Reblt W W J5	250 hr	$8,000	Minneapolis

Department W-7

UNIVERSAL AVIATION CORPORATION

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ALPHABETICAL INDEX TO ADVERTISEMENTS

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